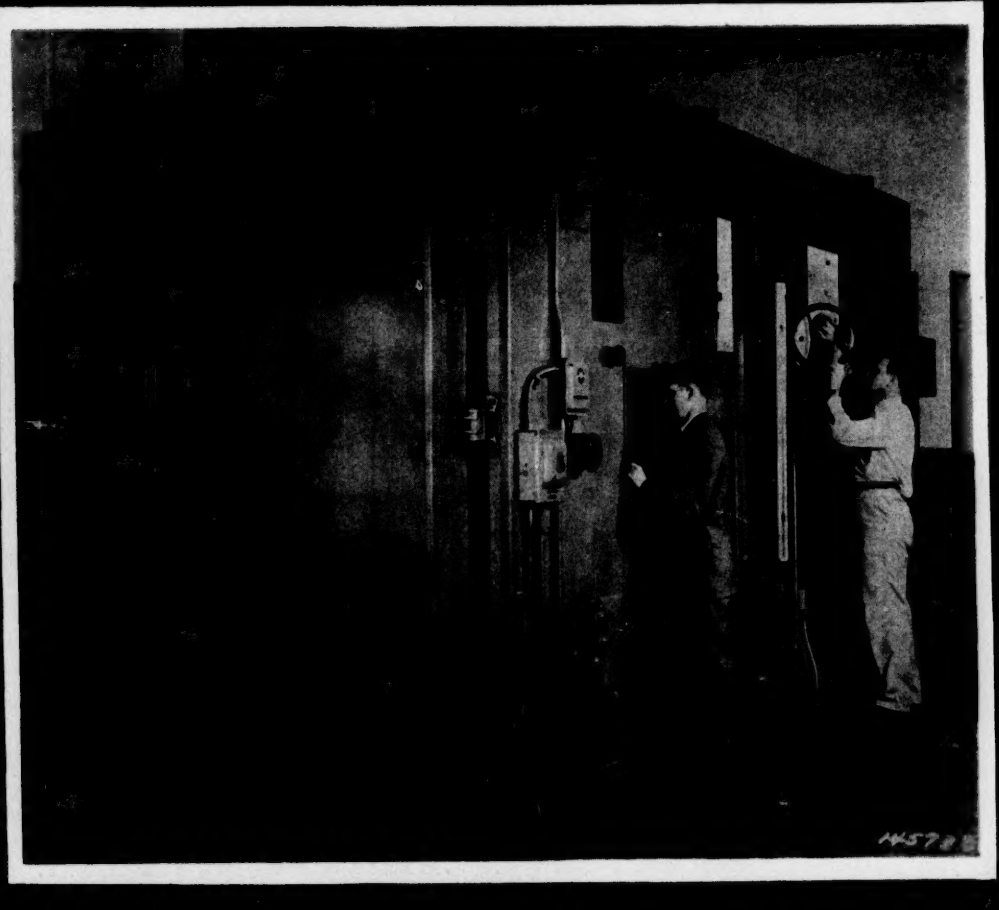
ICE REFRIGERATION



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MARCH • 1953

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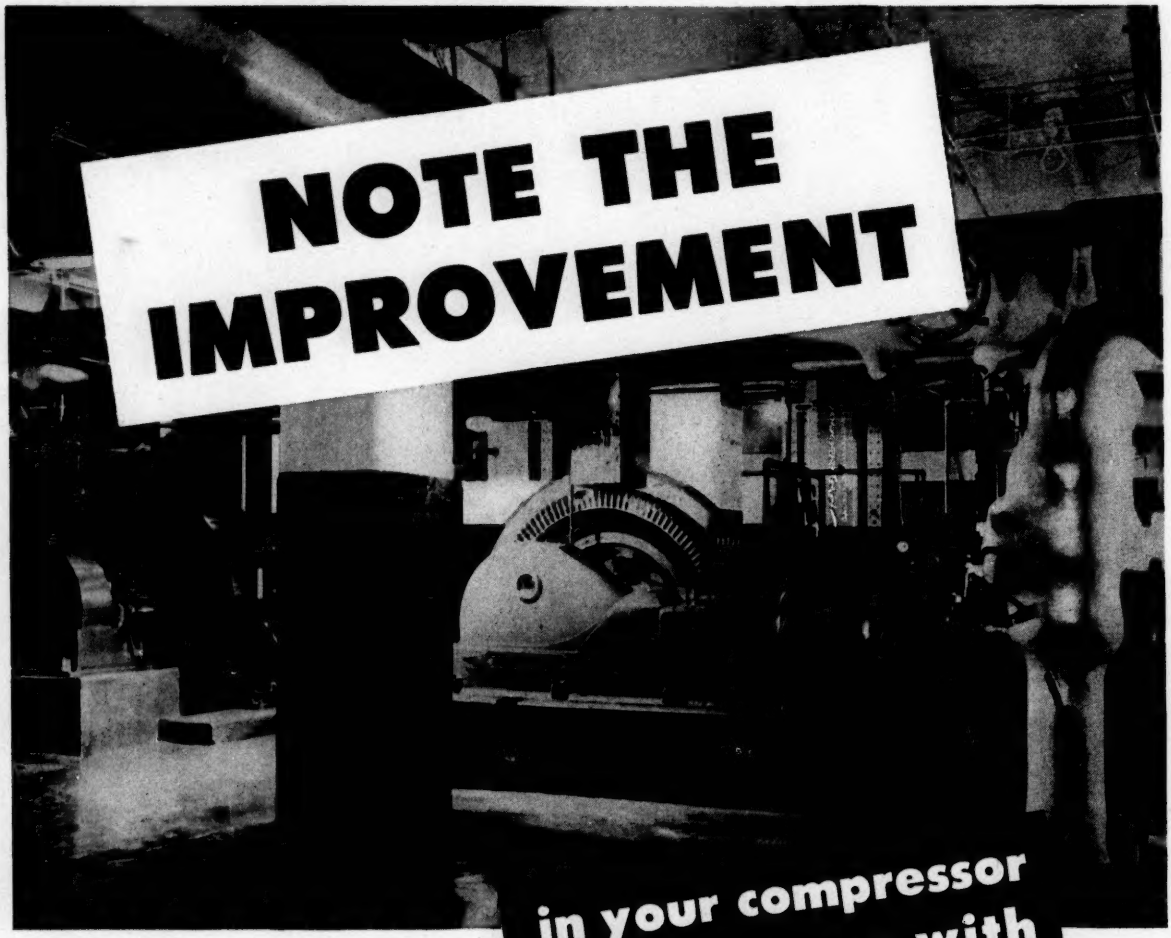


WHEN you start using *Texaco Capella Oil (Waxfree)*, you'll enjoy more efficient refrigeration. That's what operators everywhere have found. *Texaco Capella Oil (Waxfree)* has remarkably low haze and floc temperatures. It won't "wax out" in systems even down to minus 100°F.

Texaco Capella Oil (Waxfree) is also tops for purity, stability and resistance to oxidation. It does not foam, it's moisture-free and will not react with refrigerants. Whatever your refrigerating range, *Texaco Capella Oil (Waxfree)* will assure you better performance and lower maintenance costs.

There is a complete line of *Texaco Capella Oils (Waxfree)*. You can get one exactly right for your compressors whatever their size or type. These great oils come to you *refinery-sealed* in 55-gallon drums, 5-gallon, 1-gallon or 1-quart containers.

Let a Texaco Lubrication Engineer get the most out of your compressors. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

TEXACO

TEXACO Capella Oils (Waxfree)

FOR ALL REFRIGERATING AND AIR CONDITIONING COMPRESSORS

TUNE IN . . . TEXACO STAR THEATER starring MILTON BERLE, on television Tuesday nights. METROPOLITAN OPERA radio broadcasts Saturday afternoons.

COOLER-FREEZER DOOR
- Modern streamlined job
- 100% "Douglas Fir"
- Sanitary hardware

X-52 PLYWOOD PANEL DOOR
- Plywood front and back
- Extra heavy-duty hardware
- Special type gaskets

- Maximum insulation fill
- Most possible rigidity
- Allows reversal of swing

LOW TEMPERATURE DOOR
- Entire metal-clad front
- Extra heavy-duty hardware
- Special type gaskets

SUPER FREEZER (OVER-LAP) DOOR
- Extra-heavy construction
- Extra-heavy duty gaskets
- Extra heavy-duty hardware

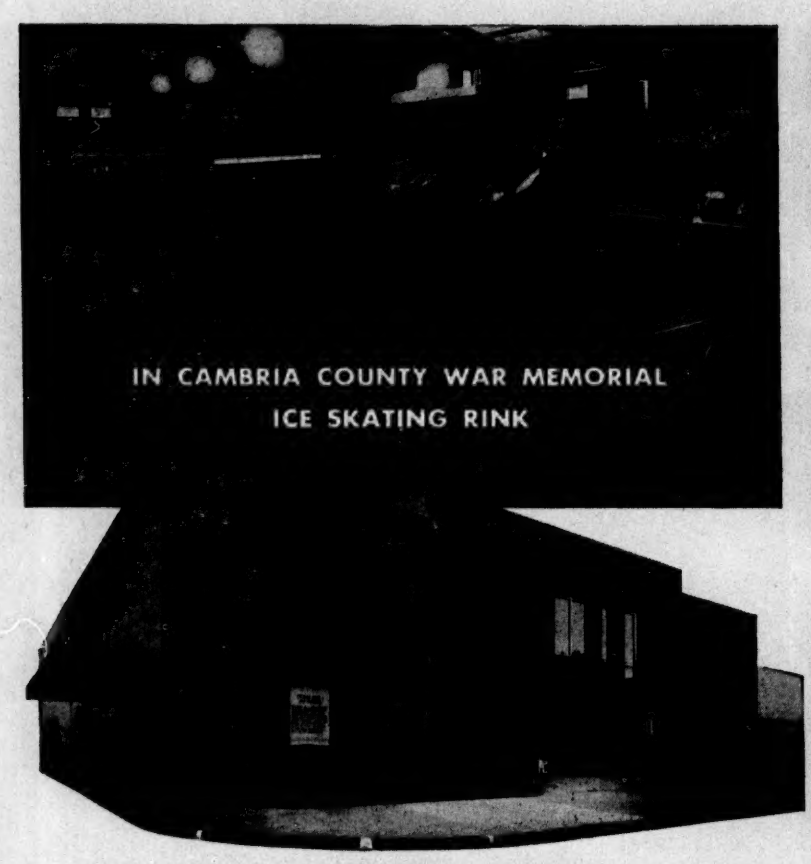
VESTIBULE DOOR
- Save time—labor
- Save refrigeration
- Large plant operation

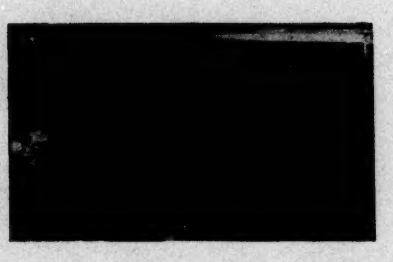
TRACK DOOR
- For abattoirs
- Meat handling rails
- Banana rooms

AUTO-CLOSE DOOR
- For loading deck
- Intra-cooler doors
- Heavy trucking

DOUBLE DOOR
- For palletizing
- For carloading
- For elevator shafts

BUTCHER BOY REFRIGERATOR DOOR CO. • HARVARD, ILL.





Wrought iron supply and return headers set in position.

Setting the insulation material before installing wrought iron pipe coils.

Wrought iron pipe lined up for joining with the headers.

Wrought iron pipes, placed on horses, ready for welding.

Covering installed coils of wrought iron pipe with concrete.

BYERS WROUGHT IRON PIPE

defends against corrosive attack along a 10-mile "FRONT"

Thoroughly familiar with the corrosive conditions which threaten the service life of ice rink floor piping, the designers of this Johnstown, Pa., indoor hockey and skating rink solved the problem of premature failure by specifying a durable pipe material. Ten miles of Byers Wrought Iron pipe was used in the refrigeration system. Downspouts, soil waste and vents are also safeguarded by this time-tested material.

Hunter, Caldwell & Campbell, Altoona, Pa., were the architects; H. F. Lenz, Johnstown, Pa., was the engineer; Ward Refrigeration & Engineering Co., Louisville, Ky., installed the skating rink, while A. J. Sloan Co., of Johnstown, Pa., installed the plumbing. This is a Carpenter Ice Rink Floor.

Our bulletin, WROUGHT IRON IN REFRIGERATION AND AIR CONDITIONING SYSTEMS, tells why genuine wrought iron is the number one choice for ice rink piping. Write for your copy.

A. M. Byers Company, Pittsburgh, Pa. Established 1864. Boston, New York, Philadelphia, Washington, Atlanta, Chicago, St. Louis, Houston, San Francisco. Export Division: New York, N.Y.

BYERS

CORROSION COSTS YOU MORE THAN WROUGHT IRON

WROUGHT IRON

TUBULAR AND HOT ROLLED PRODUCTS

ELECTRIC FURNACE QUALITY ALLOY AND STAINLESS STEEL PRODUCTS

ICE and Refrigeration

VOLUME 124 NUMBER 3

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March, 1953

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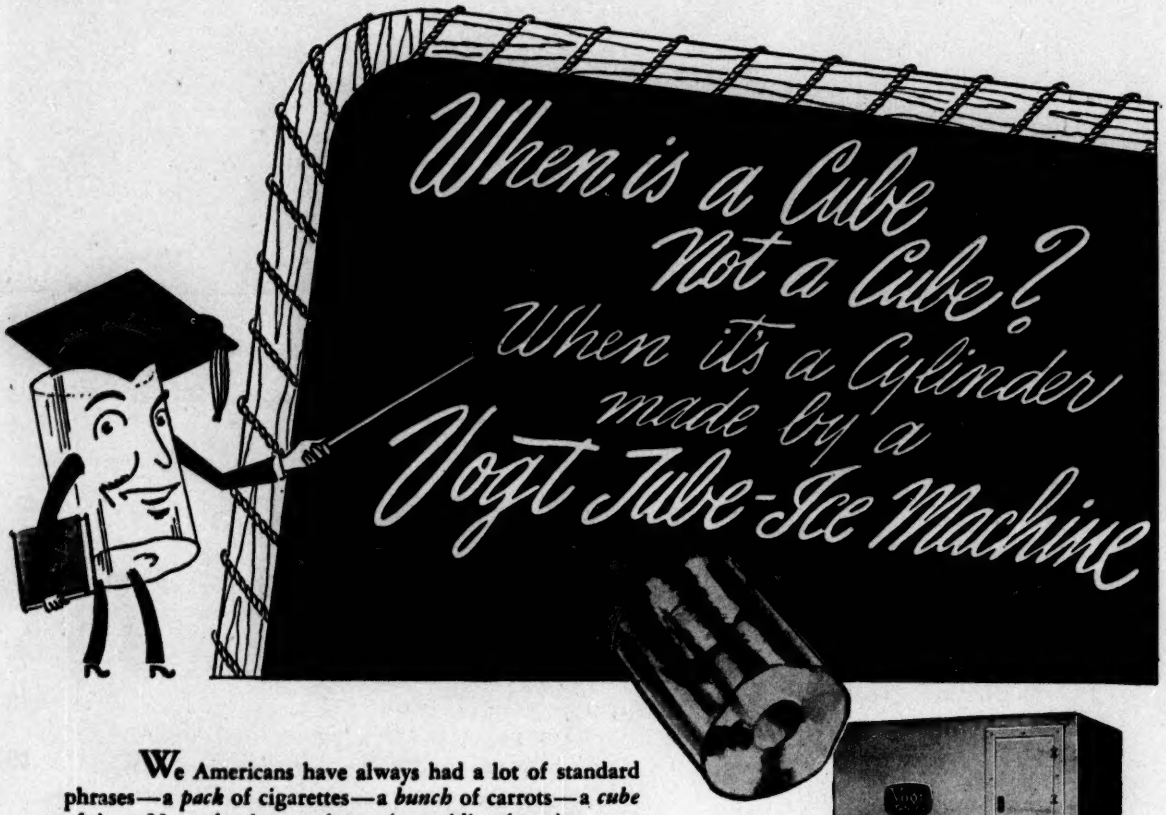
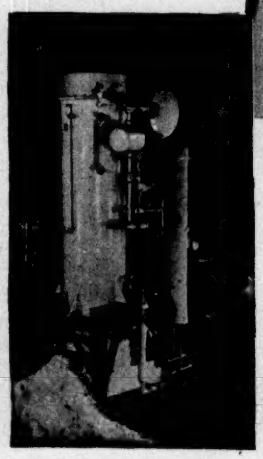


We Americans have always had a lot of standard phrases—a *pack* of cigarettes—a *bunch* of carrots—a *cube* of ice. Now the latter phrase is rapidly changing to a *tube* of ice, Tube-Ice, as exemplified by the sized "ice with the hole," originally introduced by Vogt in 1938.

The distinctive cylinder shaped, clear, hard, sparkling ice cylinders made by the Vogt Tube-Ice Machine are purer than the water from which they are frozen. They have less adhesion in storage, more nearly fit a glass and, because of the "hole," provide more cooling surface to beverages. And Tube-Ice is produced by the Machine ready-for-use and free of human contact whereby it enjoys top sanitation ratings from health authorities everywhere.



Vogt

Automatic

TUBE-ICE MACHINE

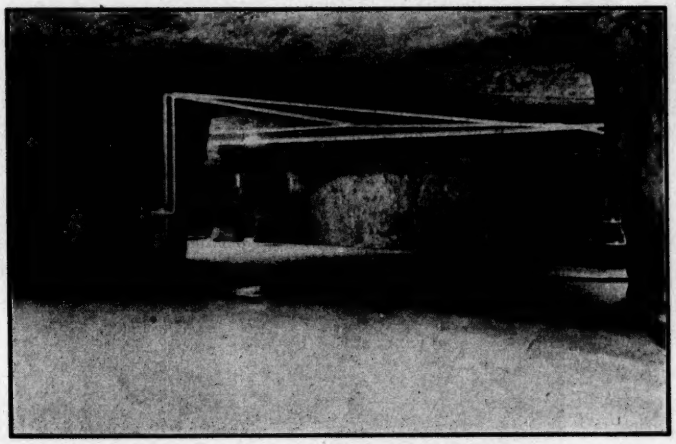
Tube-Ice Machines are available as package units in 2000 pound and 5000 pound capacities respectively.

For requirements of 3 tons of ice per 24 hours or greater, complete units are furnished disassembled prior to shipment for reassembly at destination.

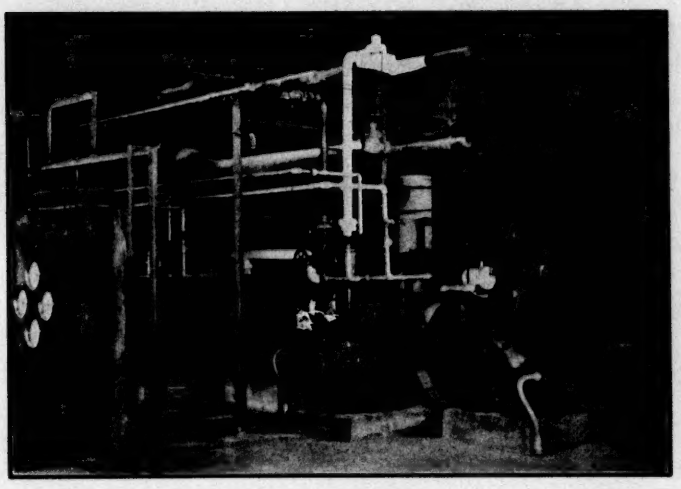
HENRY VOGT MACHINE CO., LOUISVILLE, KY.

BRANCH OFFICES: New York, Philadelphia, Chicago, Cleveland, St. Louis, Dallas, Charleston, W. Va.

HUGE NATURAL STORAGE INSTALLS Frick Refrigeration THROUGHOUT



Two of the 28 Frick air units which cool 2,428,875 cubic feet of storage space at Coldspur.



Three of the four Frick ammonia compressors used by the Natural Storage Co., Coldspur, Kansas.

Nearly two and a half million cubic feet of refrigerated space in this former limestone quarry at Coldspur, Kansas, are held at temperatures between –10 and +40 degrees by four Frick compressors and 28 Frick air cooling units.

Thus another important plant is added to the list of cold storages that have selected Frick refrigeration equipment for its dependability and economy.

For competent assistance on air conditioning, process work, cold storage, ice making, quick-freezing, or other refrigeration projects, get in touch with your nearest Frick Branch or Distributor. They're in principal cities everywhere.

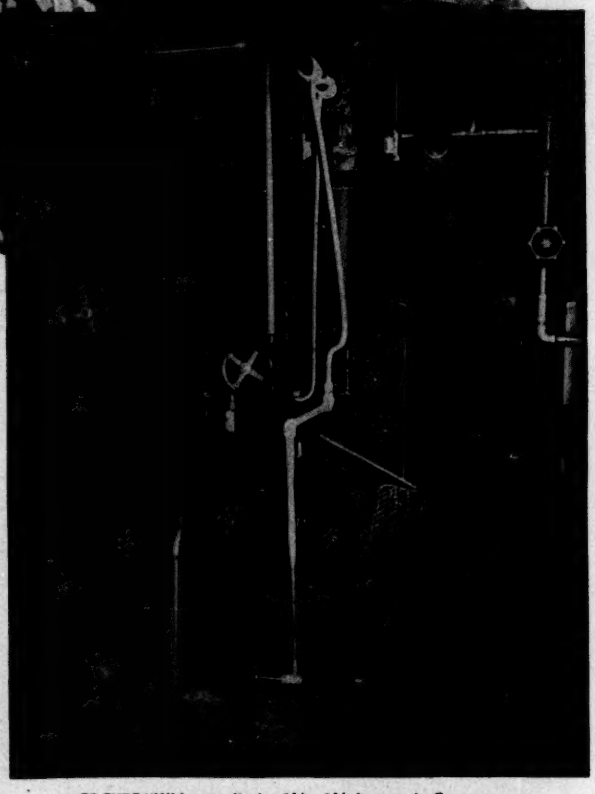
FRICK CO.

60° below?

If you run a research and testing laboratory you may well need a temperature of −60°F.—and CP can give it to you. Or if you need 40° below for freezing foods, or zero, or 70° above—CP is still your source for the right refrigeration equipment. Whatever you need, CP can furnish you with a refrigeration system that's engineered to fit your process and give you the top efficiency and performance that result in real economy.

CP's broad line of refrigeration machinery includes ammonia compressors from 1½ to 200 tons capacity, Boosters and Compact Ice Builders... and each superior design is backed by CP's sixty years of leadership in the refrigeration field.

Get in touch with your CP Representative today. Talk over your refrigeration problem, and let him show you how a CP system can save you *cold cash.*



CP TYPE "K" four-cylinder 3½ x 3½ Ammonia Compressor in operation at Zwicker and Co., Lunenburg, Nova Scotia.

THE *Creamery Package* MFG. COMPANY

General and Export Offices: 1243 W. Washington Blvd., Chicago 7, Illinois

Atlanta • Boston • Buffalo • Chicago • Dallas • Denver • Houston • Kansas City, Mo. • Los Angeles
Minneapolis • Nashville • New York • Omaha • Philadelphia • Portland, Ore. • St. Louis • Salt Lake City
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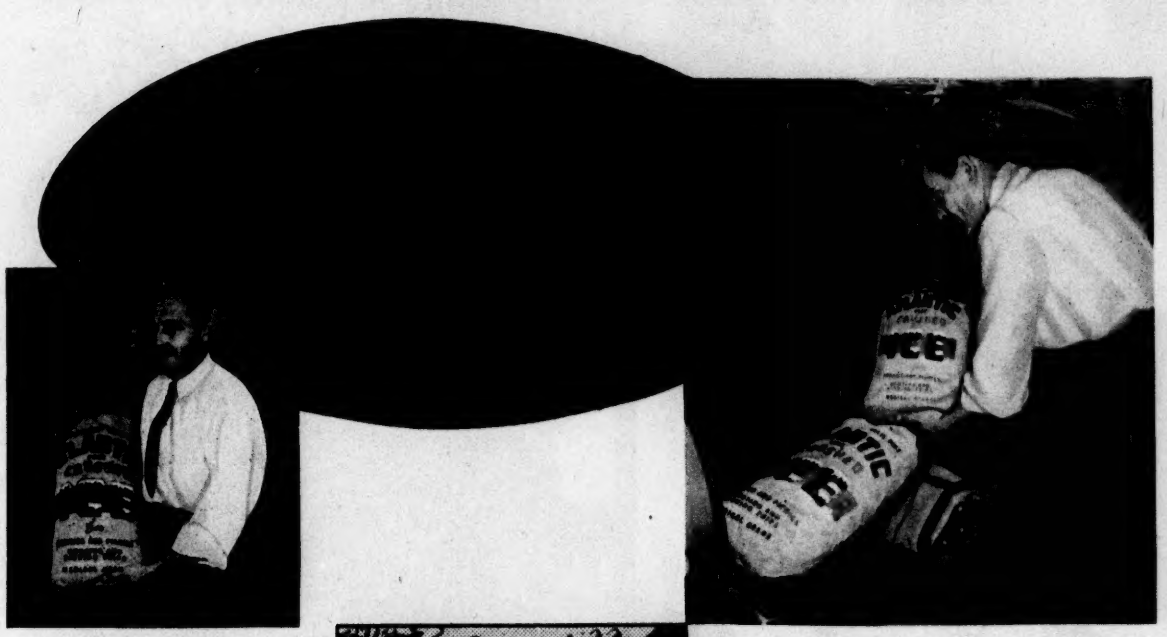
CREAMERY PACKAGE MFG. CO. OF CANADA, LTD.
267 King Street, West, Toronto 2, Ontario

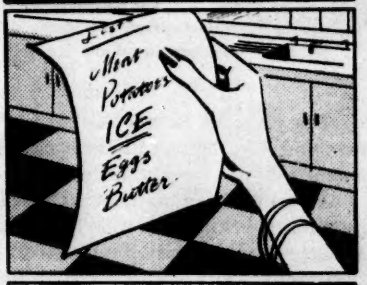
THE CREAMERY PACKAGE MFG. COMPANY, LTD.
Mill Green Road, Mitcham Junction, Surrey, England

TAKE A TIP FROM A COMPANY THAT HAS MADE IT PAY



"I'm right on the sales firing line," says this drive-in attendant. "I *know* that Union Ice Bags give satisfaction."

Good-looking, dependable wet-strength Union Ice Bags hold up, even in hot weather. Atlantic, which operates in the South, has been using Union Ice Bags since the company first began to sell packaged ice.



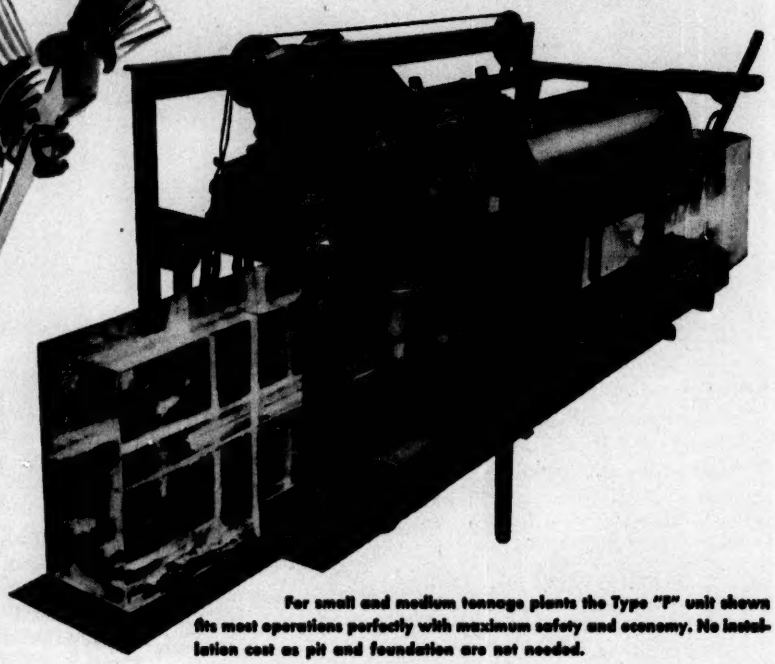
OWNERS of "drive-ins" are on the alert for new lines that build traffic. Processed ice in convenient paper sacks not only stops passing motorists, but brings customers from miles away.

UNLIKE many traffic-building items, packaged ice is profitable in itself. The retailer earns a full mark-up on every sale. Packaged ice sales are truly extra business, because the customer who takes home a bag of ice does not buy it at the expense of something else.

REPEAT business is a packaged ice dividend. When folks know where they can get conveniently-packaged ice, in the form they want it, when they want it, they quickly develop the habit of going back.

OTHER items benefit too. You can safely assure retailers that sales of packaged ice stimulate more business throughout the store. Beer, ice cream, carbonated beverages, frozen foods, specialties like watermelon, are just a few examples.

Tops in ice scoring...



For small and medium tonnage plants the Type "F" unit shown fits most operations perfectly with maximum safety and economy. No installation cost as pit and foundation are not needed.

GIFFORD-WOOD TYPE "F" SCORING MACHINE

G-W ICE TOOLS

A complete line of top-quality hand-tools . . . tongs, hooks, shavers, bars, chisels, etc. . . . designed to make manual handling of ice easy and safe—made tough to stand the gaff of years. Write for Bulletin No. 480.

"Our Type 'F' Scorer has been in constant use for nearly 14 years and has... given the best service of any piece of equipment we have bought since we started in business in 1906."

We think this statement from one user speaks volumes for the quality of the Gifford-Wood Type "F" Scoring Machine. It is a rugged unit, precision-built to do a clean, even scoring job over many years—with a minimum of maintenance.

One-man operation of a G-W Type "F" Scorer delivers three or more 300- or 400-lb. cakes per minute—either in the storage room or on the platform. Completely portable, no hold-down bolts needed.

For full information on other types of ice scorers manufactured by Gifford-Wood, write for Bulletin 116A.

GIFFORD-WOOD CO.

NEW YORK 17 — *Since 1814* — CHICAGO 6

420 Lexington Avenue — HUDSON, N. Y. — 565 W. Washington St.

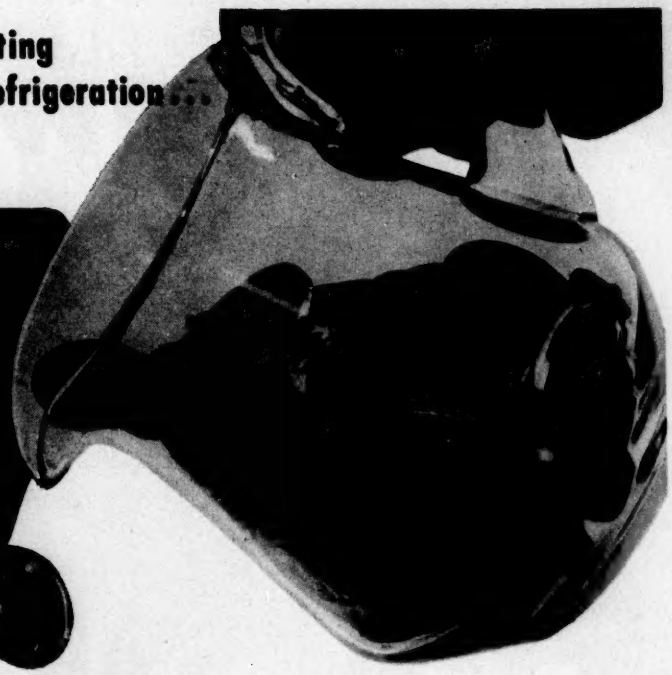
Pacific Coast Representative: Western Ice Equipment Company, 420 Market St., San Francisco 11

Cuber — Bucket-Elevator — Conveyor — Bruster

In planning or estimating low temperature refrigeration...

Why pour money down the drain

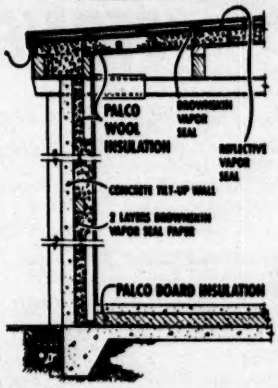
MOISTURE WASTES DOLLARS



Now TILT-UP WALL CONSTRUCTION saves up to 40% on installation costs

PALCO WOOL Insulation
stays dry... won't trap moisture

Refrigeration engineers agree that no vapor seal is 100% effective. But with PALCO WOOL, vapor seal is applied *before* insulation is installed, permitting inspection and sealing to make it as moisture-proof as possible. Also, any moisture that might penetrate the vapor seal freely migrates through PALCO WOOL and does not become trapped behind successive vapor dams. There's no accumulation of moisture or back-soak to cause loss of efficiency and eventual costly repairs. In-place field tests of PALCO WOOL installed years ago prove it has less moisture than the day it was installed. For positive proof of these and other facts write today for Technical Bulletin 302.



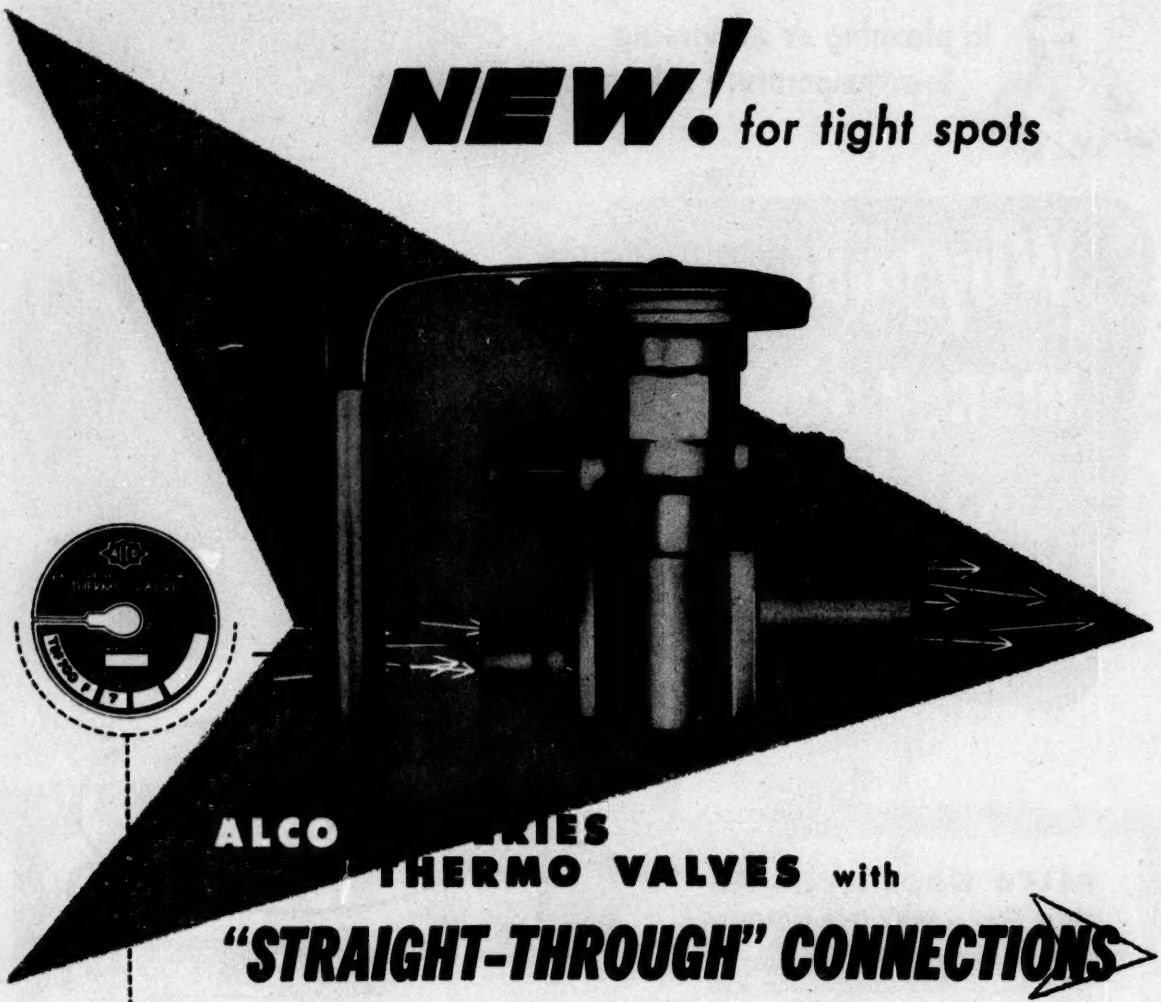
Write for free Estimator's Data Sheet No. TW-1 with detail drawing, construction plan, and estimator's cost guide for money-saving tilt-up wall using PALCO WOOL Insulation. No obligation.

Send for Free Sample of PALCO WOOL for your own inspection

THE PACIFIC LUMBER COMPANY
100 BUSH STREET, SAN FRANCISCO 4, CALIFORNIA
35 EAST WACKER DRIVE, CHICAGO 1, ILLINOIS

PALCO INSULATION WOOL

NEW! for tight spots



ALCO [illegible]RIES
THERMO VALVES with
"STRAIGHT-THROUGH" CONNECTIONS

New description code for all ALCO VALVES: The type number expresses the capacity:

EXAMPLES:
TCL 200 = 2 tons
THL 5000 = 50 tons

This makes it easier for you to select the right valve, to keep stock and to avoid errors.

Easy to install in tight spots. You work from *above*... no twisting and turning. "Straight-through" connections fit over any type of distributor. They give you the same easy, on-the-line servicing features as Alco "T" Valve with angle-type connections.

When ordering, please specify whether "angle-type" or "straight-through" connections are desired. For "Freon-12", "Freon-22", Methyl Chloride. Write for further information.

SEE YOUR ALCO WHOLESALER

ALCO VALVE CO.
835 KINGSLAND AVE. • ST. LOUIS 5, MO.

Designers and Manufacturers of Thermostatic Expansion Valves; Evaporator Pressure Regulators; Solenoid Valves; Float Valves; Float Switches.

5548

In the Spotlight

THE REFRIGERATED storage of popcorn was the subject of a recent experimental investigation at Iowa State College. Results, published in the article starting on page 13, show the effects of various temperatures, containers and humidities, and as Part 2, page 17, the effect of storage temperatures on insect infestation.

EXTREMELY LOW and high temperatures are being produced at the Bell Telephone Laboratories at Whippany, N. J. as an aid in producing equipment for the armed forces. For pictures and story see page 19, also cover picture.

THE OFFICIAL CALL has sounded for the 62nd annual meeting of the American Warehousemens Association to be held at Washington, D.C., May 17-21. For details see page 21.

COOLER OCCUPANCY of cold storage holdings declined three points during January which was about average for the year. Freezer occupancy was above the 5-year average by one point. Other details of holdings at the end of January are given in summary of report on page 25.

THE FIRST of a series of training conferences for refrigerated warehouse personnel was held at St. Louis February 1-5. Problems and principles of warehouse operation and management were discussed by lectures and on an open forum basis. See page 27 for report.

A NEW PROCESS known as Vacuum Cooling has been developed in California for preparing fresh vegetables and fruits for shipment. See story on page 45.

COVER PICTURE: A large stratosphere chamber at the Bell Telephone Laboratories at Whippanny, N. J. The man in the foreground is watching the equipment under test through an observation window; the other man is at the control panel. For description see story on page 19.

THE FACT Finding Conference of the Institute of American Poultry Industries presented a full program of lectures and discussions of interest to members of the poultry industries. For report of the Conference, see page 28.

RESEARCH in the Ice Industry has produced profitable techniques and more are to come through current projects that are now under way. This story is told, and the very important subject of sanitary ice is analyzed in report of C. P. Austin, director of Research at the annual Ice Convention. See page 41.

THE NECESSITY of creating freezing temperature in a short space of time has led to the design of evaporator coils with a high rate of pickup. The design and operation of these coils are discussed in the NAPRE paper on page 29.

ICE Associations are holding their annual conventions. For reports and announcements of future meetings, see page 47.

50 Year Subscriber

A LETTER with check for a two year renewal subscription, revealed that H. C. Michener, president of the Media Ice & Storage Company, Media, Pa. has been a continuous reader of ICE AND REFRIGERATION since 1903. Mr. Michener thus joins the select circle of subscribers who have been readers for fifty years or more.

60 Years Ago

From the March 1893 Issue of ICE AND REFRIGERATION

THE ICE CROP of 1893 was unequalled in all respects by any harvest made for a number of years. If any houses were empty they were so by design and not through want of ice. Beginning in December, ice making weather continued through January and well into February. Some one estimated the cut for the whole country at 40,000,000 tons.

THE SOUTHERN ICE Exchange held its fourth annual meeting at Atlanta, Ga., February 22. In his annual address President Chas. W. Biese called attention to the fact that the Exchange was designed to promote fellowship and that this would help to eliminate misunderstandings and business conflicts; and that it was not designed to form a trust nor to fix prices for the product.

THE BRITISH GOVERNMENT, it is reported, has decided to establish cold air meat storage stations at Gibralter and other military posts on the route to India. It was thought this might lead up to an extension of the frozen meat trade between Australia and the British Islands.

THE MONTH of January this year was one of the coldest that had been experienced for many years. Beginning the holiday week the cold increased in intensity until about January 15 when it reached its severest in the Northwest, the temperature in Chicago reaching the lowest point it has touched since February, 1888—16 degrees below zero. During this period the entire country was affected, from the Lakes to the Gulf, and from the Atlantic to the Rocky Mountains, while Europe suffered as severely as America. About Christmas, there was freezing weather in Louisiana.

WHAT SOME OF the members of the country press don't know of cold storage is illustrated by this bit of "information" culled from a Maine newspaper: "If it is found that vaults holding fruit are getting dangerously near the freezing point, some brine is passed throught the pipes and the temperature is raised. In some of the underground vaults a low temperature once established will remain fixed for months, as long as the doors exclude the outside air.

Carrier Ammonia Refrigeration freezes the flavor of Hawaii in Dole Pineapple Juice

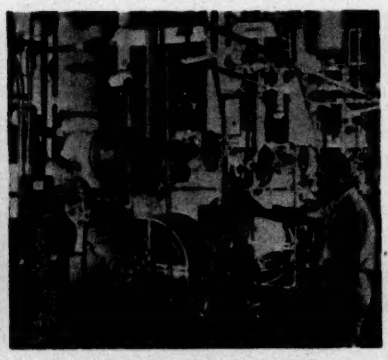
Something new's been added to concentrates. And to processing methods, too.

Sparkling new Frozen Concentrated Hawaiian Pineapple Juice goes to market with *full* natural taste. Its flavor-bearing volatile esters are "caught" early in the process, then added back in the final product.

What's more, the Carrier Ammonia refrigeration plant operates 24 hours a day on *two* products. The concentration cycle is split into two stages — 6 and 18 hours long. In the first, the juice is received, partially concentrated and stored. In the second, it's concentrated, canned and frozen.

This frees the freezing tunnel during the first period to process pineapple chunks.

Dole's new plant at Honolulu is the most modern of its type in the world. So, naturally, you'd see Carrier Ammonia equipment on the job — Ammonia Compressors, Ammonia Evaporative Condensers, Ammonia Cold Diffusers . . . made to meet the need for modern refrigeration. Carrier Corporation, Syracuse, New York.



Here at the Dole installation are 2 of the 5 Carrier Ammonia Compressors which develop a total of 350 tons of refrigeration at suction temperatures ranging from minus 47 degrees to plus 40 degrees. At right a battery of Carrier Cold Diffusers keeps warehouse temperatures at minus 10 degrees F.

COLD STORAGE OF POPCORN

Effect of storage temperature and length of storage on the moisture content and popping volume of popcorn, as determined by study at Iowa State College, Ames, Iowa.

JOHN C. ELDREDGE and I. J. JOHNSON

Associate Professor and Professor in Charge of Farm Crops Iowa State College, Ames, Iowa.

DURING recent years there has developed an increased interest in refrigerated storage of popcorn. Three major reasons may be involved. First, some popcorn processors have reported increased popping volumes from popcorn subjected to below freezing temperatures after the crop had been dried sufficiently to prevent injury from low temperature. Second, the development of storage methods to maintain proper moisture content for maximum popping volume would be an asset to the industry. Third, insect control is a very important problem, especially in the southern part of the United States. It is often difficult for processors to be certain that popcorn thoroughly fumigated at time of shipment does not become infested with insects enroute or in the consumers' warehouse.

The investigation reported here is concerned only with the effects of storage of shelled popcorn at varying temperatures in different types of containers and for different intervals of time to measure the effects of these factors on popping volume and moisture content. Studies on insects in stored popcorn will be reported in a separate paper.

Materials and Methods

Two distinctly different types of popcorn were used in these studies; Iopop 5, a Jap Hulless type hybrid, and P32 (also known at K4), a hybrid of yellow pearl type. Iopop 5 has a rather small kernel while P32 has a relatively large kernel as compared to other yellow hybrids. Iopop 5 normally has an expansion of 30 volumes and P32 about 32.5 volumes. In this study popping volumes were somewhat higher than normal, particularly in 1951. This may have been due to the care taken to adjust moisture content at the optimum percentage for highest popping volume at the start of each year's tests.

Shelled popcorn at optimum moisture content was stored in four types of containers, as follows:

1. Sealed metal cans of the types used by commercial canners of fruits and vegetables. The cans each contained one pound of shelled corn from a bulk lot and were sealed at once on an automatic can sealer.

2. Polyethylene bags inserted in a heavy kraft paper bag. This container was used to simulate cloth or paper bags lined with asphalt or other impervious material commonly used by popcorn processors for shipping popcorn. One pound of corn was placed in each bag and the bags closed by folding the inner liner three times and fastening with two paper clips. The outer kraft bag was then folded over and held by paper clips.

3. Cloth bags. These were small medium weight cotton bags with a rather tight weave. One pound of corn was used in each bag.

4. Cellophane bags, such as are used by grocery stores for displaying popcorn. One pound of corn was used in each bag and the tops were folded tightly and sealed with scotch tape. The corn in cellophane bags was not refrigerated but was stored only at a room temperature of 70 F.

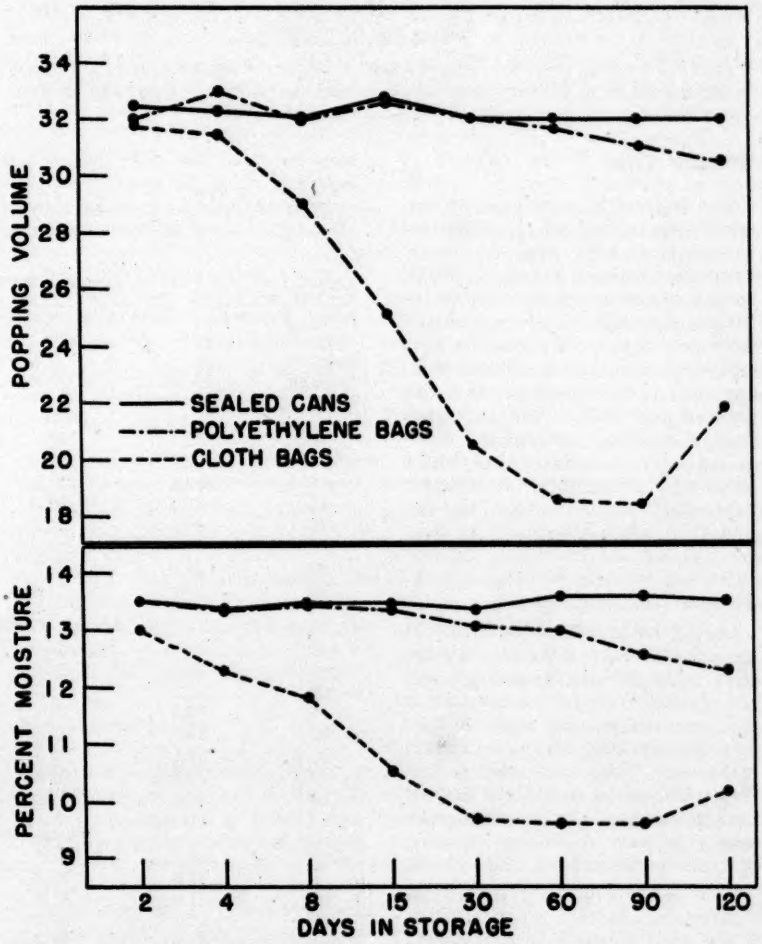


Fig. 1—Popping volume (upper) and moisture content (lower) of popcorn stored in different types of containers at 70F and removed at time intervals from two to 120 days.

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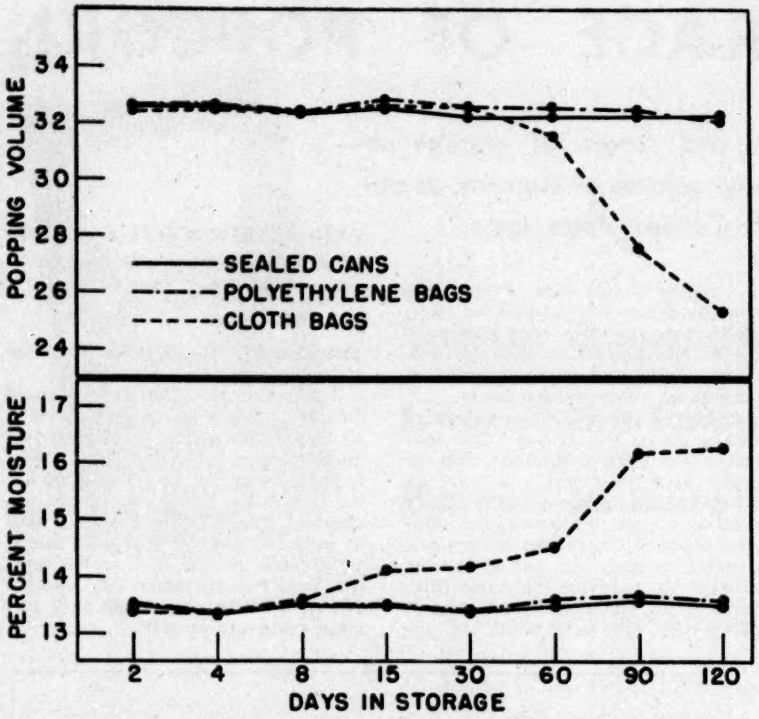

Fig. 2—Popping volume (upper) and moisture content (lower) of popcorn stored in different types of containers at 45F and removed at time intervals from two to 120 days.

Storage Time

The popcorn in each type of container was stored for ten different lengths of time in 1950, as follows: 12 hours, 24 hours, 2, 4, 8, 15, 30, 60, 90 and 120 days, respectively. In the 1951 experiments, based on results in the previous year, the first two periods were eliminated and the remaining eight periods continued as in the previous year's tests. Popcorn in each type of container (except the cellophane bags) was stored at each of the following temperatures in degrees Fahrenheit: -10, 0, +32, +45, and +70. The relative humidity at temperatures 45 and 70 F were not well controlled because the storage lockers were frequently opened.

During both 1949-50 and 1950-51 the actual storage of the corn did not start until January because it was not possible to adjust the moisture of the corn before that time. Studies with the 1949 crop corn were started in January, 1950, and ended in late May, 1950, at the end of 120 days of storage. Studies with the 1950 corn crop also were started in January, 1951, and ended in May, 1951.

Because there was a tendency for moisture to condense on the surface of the corn stored at low temperatures when removed from the lockers it was necessary to transfer the samples from the polyethylene and cloth bags to fruit jars with sealed lids **before** bringing the samples into the warmer air outside. In order to keep all samples under uniform conditions they were placed in tight jars immediately upon removal from their respective storage places and taken at once to the popping laboratory.

As soon as the samples stored at low temperature were sufficiently warm to prevent condensation of outside moisture (usually within a half hour), three samples were popped at once. The remainder of the sample was sealed and kept for a day or two until a moisture test could be made. Two additional samples were then popped. The corn was popped on the Official Volume Tester used for all popping experiments. Popping was done by an experienced technician. The same technique was followed for all samples as to amount of popping oil and temperature of the popper. Moisture tests were made on the Steinlite moisture tester.

Experimental Results

The data from each of the two varieties in both years followed nearly identical trends. For this reason presentation of detailed results separately by variety and year did not appear justified or necessary.

Popping Volume

The data on popping volume obtained from the two-year study are summarized in Table 1 and shown in Figs. 1 to 3 for temperatures of 32,

TABLE 1.—TWO-YEAR AVERAGE POPPING VOLUME OF TWO TYPES OF POPCORN STORED IN SEALED CANS, POLYETHYLENE BAGS, AND CLOTH BAGS AT BELOW AND ABOVE FREEZING TEMPERATURE AND TESTED AT SUCCESSIVE PERIODS OF STORAGE.

Days in Storage	Temperatures -10° F.	0° F.	32° F.	45° F.	70° F.
			Stored in Sealed Cans		
2	32.2	32.2	32.4	32.5	32.5
4	32.5	32.8	32.4	32.6	32.3
8	32.4	31.8	32.3	32.3	32.0
15	33.0	32.9	32.6	32.5	32.8
30	32.2	32.3	32.2	32.1	32.0
60	32.2	32.1	32.6	32.2	32.0
90	32.0	31.8	32.1	32.2	32.0
120	32.0	31.8	31.9	32.2	32.0
			Stored in Polyethylene Bags		
2	32.3	32.1	32.5	32.5	32.0
4	32.6	32.8	32.5	32.6	33.0
8	31.7	31.8	32.0	32.3	31.9
15	32.5	32.4	32.3	32.9	32.6
30	32.3	32.5	32.5	32.5	32.0
60	32.1	32.3	32.3	32.5	31.7
90	32.0	32.4	32.5	32.4	31.0
120	32.0	32.0	32.3	32.1	30.5
			Stored in Cloth Bags		
2	31.9	32.1	32.3	32.4	31.8
4	32.3	32.3	32.5	32.5	31.3
8	31.8	31.5	31.6	32.4	29.0
15	32.3	32.4	32.3	32.8	25.1
30	32.4	32.3	31.3	32.6	20.6
60	31.9	32.5	31.1	31.7	18.7
90	31.9	32.0	31.0	27.3	18.4
120	31.8	31.8	30.7	25.3	21.9

45, and 70 F. Each value represents the mean of 20 samples. The most critical data on the effect of storage temperatures on popping volume should be obtained from samples stored in sealed tin cans. With this container there would be no change in moisture content and hence any changes in popping volume would be due to the affects of storage temperature.

The results in Table 1 for samples stored in tin cans show no consistent trend for changes in popping volume from the beginning to the end of the storage period. Consequently, it seemed justifiable to obtain an average popping volume for the total period of storage for purposes of comparing storage temperature effects over the entire storage period. These average values are shown in Table 2.

Popping volumes of samples stored in sealed cans clearly show no effect due to storage temperature. Average volumes for both types over the two-year period ranged from 32.3 to 32.4, a difference of only 0.1 volume. These data, based on a very large number of samples, would indicate that freezing of popcorn at optimum moisture content has no significant effect upon popping volume when samples are stored in containers that prevent moisture loss during storage. Actual changes in moisture content during storage will be presented in a subsequent section of this report.

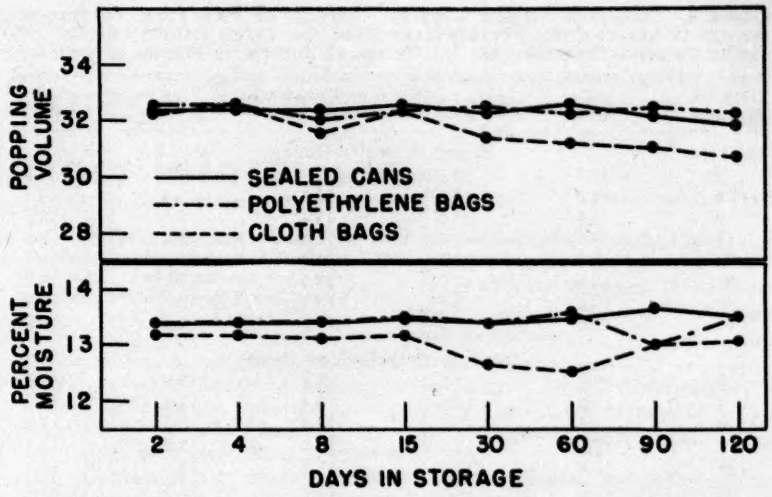

Fig. 3—Popping volume (upper) and moisture content (lower) of popcorn stored in different types of containers at 32F and removed at time intervals from two to 120 days.

Samples stored in polyethylene bags maintained a constant popping volume during the entire storage period at temperatures from -10 F to 45 F. At storage temperature 70 F. there was a slight reduction in popping volume after 90 days and 120 days of storage. This slight drop can be seen in the upper portion of Fig. 1. It should be recalled that relative humidity was not controlled at this temperature.

When popcorn samples were stored in cloth bags the results were quite different from those obtained from samples stored in sealed cans and polyethylene bags. The data in the lower third of Table 1 clearly show no change in volume at storage temperatures below freezing and a very marked loss in volume after eight days of storage at 70 F.

The two-year average values for both types of popcorn show that popcorn stored for four months at either -10 F or 0 F popped as well as it did at the beginning of storage. A gradual, but slight, reduction in popping volume was obtained in storage at 32 F. At 45 F popping volumes were greatly reduced at 90 days of storage and at 70 F reduction in volume began after eight days of storage with volumes drastically reduced in 15 days. The comparative changes in volume are shown in Figs. 1 to 3. The cause for losses in volume were due to changes in moisture content as shown in Section II of this report.

TABLE 2.—AVERAGE POPPING VOLUME OF TWO TYPES OF POPCORN STORED IN SEALED METAL CANS AT BELOW AND ABOVE FREEZING TEMPERATURE AND SAMPLED AT 8 TO 10 SUCCESSIVE DATES OF STORAGE.

Storage Temperature	Yellow Pearl 1950	Yellow Pearl 1951	Jap Hulless 1950	Jap Hulless 1951	Average
-10° F.	33.0	34.3	29.5	32.8	32.8
0° F.	32.9	33.9	29.5	32.3	32.3
32° F.	33.0	33.9	29.5	32.3	32.3
45° F.	33.1	34.1	29.5	32.4	32.4
70° F.	32.8	34.0	29.4	32.4	32.4

Moisture Content

Moisture determinations made on each sample of popcorn at the time of popping are given in Table 3 separately for the three kinds of containers, storage temperatures, and periods of time. Because results at temperatures of -10 and 0 F showed no change during the period of storage, only the data for temperatures 32, 45 and 70 F were presented also in Figs. 1 to 3.

Moisture content of corn stored in sealed cans did not change, as would be expected, regardless of temperature or length of storage. Small variations of from .2 to .3 are due to random sampling error. The average moisture content of 13.5 percent would be optimum for highest popping volume.

Samples stored in polyethylene bags maintained optimum moisture content when stored for 120 days at temperatures from -10 to 45 F. There was a definite trend, however, for loss in moisture when stored at 70 F as shown in Fig. 1. As previously stated, the relative humidity was not controlled at either 45 F or 70 F and became very low during the winter months in the heated temperature chamber at 70 F. It is apparent that polyethylene bags were not completely moisture-proof at the low humidity level since moisture content of the corn was reduced about one percent by the end of four months of storage at 70 F. This moisture loss was sufficiently great to slightly reduce popping volume as shown in the upper half of Fig. 1.

Storage in Cloth Bags

Moisture content of samples stored in cloth bags provides the answer to the changes in popping volume presented in Table 1. At the storage temperatures of -10 and 0 F there was no appreciable change in moisture content, although the values were slightly higher near the end of the storage period at 0 F. Popping volumes were unchanged and hence this slight increase may have been chance variation. At 32 F moisture content was slightly lower, on the

TABLE 3.—TWO-YEAR AVERAGE MOISTURE CONTENT OF TWO TYPES OF POPCORN STORED IN SEALED CANS, POLYETHYLENE BAGS, AND CLOTH BAGS AT BELOW AND ABOVE FREEZING TEMPERATURES AND TESTED AT SUCCESSIVE PERIODS OF STORAGE.

Days in Storage	Storage Temperature -10° F.	0° F.	32° F	45° F.	70° F.
		Stored in Sealed Cans			
2	13.7	13.7	13.4	13.5	13.5
4	13.6	13.2	13.4	13.4	13.4
8	13.5	13.5	13.4	13.5	13.5
15	13.5	13.6	13.5	13.5	13.5
30	13.4	13.4	13.4	13.4	13.4
60	13.5	13.6	13.5	13.5	13.6
90	13.6	13.6	13.7	13.6	13.6
120	13.5	13.5	13.5	13.5	13.5
		Stored in Polyethylene Bags			
2	13.4	13.5	13.4	13.5	13.5
4	13.4	13.4	13.4	13.4	13.4
8	13.5	13.5	13.4	13.5	13.5
15	13.5	13.5	13.5	13.5	13.4
30	13.4	13.5	13.4	13.4	13.1
60	13.5	13.5	13.6	13.6	13.0
90	13.5	13.6	13.0	13.7	12.6
120	13.4	13.5	13.4	13.7	12.3
		Stored in Cloth Bags			
2	13.4	13.3	13.2	13 4	13.0
4	13.4	13.4	13.2	13.4	12.3
8	13.4	13.5	13.1	13.6	11.8
15	13.4	13.6	13.2	14.1	10.5
30	13.4	13.7	12.6	14.2	9.7
60	13.3	14.0	12.5	14.5	9.6
90	13.6	14.2	13.0	16.2	9.6
120	13.5	14.1	13.1	16.3	10.2

average, after 30 days of storage which probably explains the slight drop of about one volume in popping expansion.

Samples stored in cloth bags at 45 F gained greatly in moisture after 90 and 120 days of storage. Since the samples were placed in storage in January, this increase in moisture came during April and May when outside humidity normally is high. The further increase in humidity when this outside air was lowered in temperature to 45 F in the storage chamber largely accounts for the rapid build-up in moisture content of the popcorn.

Popping volumes also were greatly reduced because of above-optimum moisture content. Popcorn stored in cloth bags at 70 F lost moisture after two days of storage and rapidly reached levels far below optimum for popping. From other experimental data the relative humidity at temperature 70 F would need to be approximately 65 to maintain moisture at 13.5 percent. The rapid loss in moisture was closely related to the reduction in popping volume.

Data obtained on samples stored in cloth bags very clearly show the value of low temperatures for long-time storage of popcorn to maintain proper moisture for maximum popping volume. It is quite likely that for shorter periods of storage, temperatures of approximately 45 F may be sufficient. It should be emphasized however, that relative humidity at above-freezing temperatures must be controlled.

Cellophane Bags

The final phase of this portion of the study was a comparison of cellophane bags for storage with other types of containers at temperature 70 F and non-controlled humidity. This type of data would be of special interest to the retail merchandiser of popcorn who often keeps a supply of popcorn in one-pound bags for sale in his store. The data on popping volumes and moisture content are summarized in Table 4.

The data in Table 4 indicate that cellophane and polyethylene bags (see Table 1 and 3) are essentially equal for protection of popcorn against moisture loss at room temperature storage, at least for a period of 60 days. Both of these containers are vastly superior to cloth bags but neither one is equal to sealed cans. Their use may be recommended for storage of shelled popcorn for one to two months under the ordinary type of humidity encountered in stores.

Summary and Conclusions

From the data reported in this study some rather definite conclusions may be made and for certain aspects of popcorn storage additional research will be required.

1—These results show that the popping volume of popcorn, when stored at optimum moisture content, is neither improved nor injured when subjected to temperatures of -10 F for a prolonged period (120 days) of time.

2—Popcorn stored in polyethylene bags, or other types of lined bags, to prevent moisture loss can be stored for prolonged periods of time at temperatures of 32 to 45 F without change in popping volume or moisture content of the grain. Storage temperature of 70 F with this type of container resulted in some loss in moisture but only a slight loss in popping volume.

3—Popcorn stored in cloth bags without liners lost only a slight amount of moisture in storage for 120 days at 32 F or lower. As a result, popping volumes were slightly lower when stored at 32 F than at below freezing temperatures. Samples stored in cloth bags at 45 F and 70 F without humidity control were subject to drastic changes in moisture content and in popping volume.

4—More critical data are needed to establish relative humidity values required to maintain moisture content and popping volume of popcorn stored in cloth bags without liners at temperatures of 32 to 45 F.

5—From the combined standpoint of popping volume, moisture control, and insect control (see also paper in this Journal by Dr. Richardson) the data from this study indicate that popcorn could be advantageously stored at temperatures of 35 to 40 F.

TABLE 4.—TWO-YEAR AVERAGE POPPING VOLUME AND MOISTURE CONTENT OF YELLOW PEARL AND JAP HULLESS TYPE POPCORN STORED IN CELLOPHANE BAGS AT 70° F. WITHOUT HUMIDITY CONTROL AND TESTED AT SUCCESSIVE PERIODS OF STORAGE.

Days in Storage	Yellow Pearl Vol.	Yellow Pearl % Moist.	Jap Hulless Vol.	Jap Hulless % Moist.	Average Vol.	Average % Moist.
2	33.4	12.9	31.1	13.9	32.3	13.4
4	33.8	12.8	31.3	13.7	32.6	13.3
8	32.7	12.6	30.4	13.8	31.6	13.2
15	33.3	12.3	30.9	13.4	32.1	12.9
30	33.3	12.3	28.9	13.1	31.1	12.7
60	32.5	12.1	30.2	12.9	31.4	12.5
90	30.0	11.9	27.9	12.1	29.0	12.0
120	30.5	11.9	28.7	12.1	29.6	12.0

Cold Storage of Popcorn II

Effect of Storage Temperatures on Insect Infestation

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KILLING insects in food commodities by means of low temperatures and protecting the commodities from further insect attack by storing them at low temperatures are established methods of insect control. These methods offer several advantages over control with insecticides: (1) the commodity is not contaminated with foreign or poisonous residues; (2) it does not acquire an off-flavor or abnormal odor; (3) operators are not endangered; (4) there is no fire hazard. While it is now possible by selection of the proper material to overcome most or all of these disadvantages of insecticides, still there are situations and conditions where low temperature control of insects offers special advantages.

Combining Storage With Insect Control

Recent interest in refrigeration storage of popcorn calls attention to the advantages of combining storage practices with insect control. It would seem practical to free popcorn from living insects by cooling the corn as it goes into storage and to prevent further infestation by maintaining the corn at moderately low temperature. Such treatment would not affect the flavor or popping quality of the corn, and the need for special handling to remove gaseous or solid insecticidal residues would, of course, be absent.

Of the more common pests of popcorn, the rice weevil, *Sitophilus oryza*, the granary weevil, *Sitophilus granarius*, and the confused flour beetle, *Tribolium confusum*, are, perhaps, best known from the standpoint of resistance to low temperatures. Back and Cotton (1924) wrote a short account of the resistance to low temperatures of the two species of weevils just mentioned; this paper was followed in 1926 by a more extensive paper by Robinson (1926) on the same species. Nagel and Shepard (1934) described the effect of low temperatures on the confused flour beetle. Cotton (1950) gives additional information on the resistance of various species of stored product insects to low temperatures.

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Since a number of points pertinent to the control of insects in popcorn by low temperature were not considered fully by these authors, plans were made to make further investigations. These studies were directed toward determination of the following points: (1) The approximate time necessary to kill a test insect in popcorn by low temperatures; (2) resistance of the test insect in containers without food to a graduated series of temperatures from 0 to 30 F; (3) length of life of the test insect at 50 F and at room temperature (approximately 70 to 90 F) both with and without food (corn). One series of tests was made with broken corn kernels in comparison with sound kernels.

The rice weevil was chosen as the test insect. It is a primary pest of corn and of most other important cereals; it is known to be rather resistant to fumigants. Large cultures of it were available for the experiments.

The rice weevil lays it eggs in a cavity made by the female weevil in the corn kernel. The eggs hatch into whitish, legless grubs which feed entirely within the kernel. At favorable temperatures (about 70 to 90 F) and corn moisture (12 to 16 per cent) breeding is continuous and development proceeds from egg to adult in about four to five weeks.

Experiments with Weevils

One-half pound lots of popcorn in jars were infested with adult weevils and maintained at room temperature and 80 per cent relative humidity until the corn contained all stages of the insect. The jars were then placed in a special deep freeze apparatus at 0 F for one to 16 hours. Most of the adults free in the jars and the larvae and pupae in the corn kernels were dead in three to four hours; a few adults and larvae, however, survived the 16 hour exposure. There were always fewer living larvae than of living adults at all exposures, which confirms the earlier observations of Back and Cotton. No observations were made on the eggs; but Back and Cotton state that the eggs can withstand 30 F for 96 hours. Presumably they would succumb to 0 F in a shorter period.

Resistance of Adult Weevils To a Graduated Series of Low Temperatures

Adult weevils, in cloth-covered, wide-mouthed glass bottles, without popcorn or other food, were held at 0, 10, 20, and 30 F for various periods of time. The relative humidity was 80 per cent or higher. At the conclusion of each experiment, the containers were removed to room temperature and the insects were given food (corn). Twenty days later, the number of dead and living insects in each container was determined.

There were at least three and usually more exposure times for each temperature; the exposures were chosen to give a graded series of kills from above zero mortality to about 100 per cent. Curves were constructed from the data from which the points of approximately 100 per cent mortality could be read off. The results are given in the following table:

RESISTANCE OF ADULT WEEVILS TO LOW TEMPERATURES

Temperature (°F)	Time for 100% Kill (Hours)
0	0.5
10	0.7
20	20.0
30	93.0

These temperatures and exposure times are approximately those which must prevail throughout a bulk of popcorn in order to sterilize it so far as rice weevils are concerned. In practice, however, since the temperature of a mass of cooling corn falls slowly, a considerable proportion of the insects will die before the low point is reached; so that the actual time for high mortality will be less for the temperature finally reached than that given in the table. Robinson noted that gradual decrease in temperature was more effective in killing the rice weevil and the granary weevil in wheat than an abrupt descent of temperature. A similar relation would no doubt hold for popcorn.

Length of Life of Rice Weevil With and Without Food

In controlling insects by low temperatures, it is important to know something about the temperature limits within which life and reproduction continue. For comparison, information on the length of life at normal temperatures must also be available.

A considerable amount of study has been made on these points. At ordinary room temperatures and 70 to 80 per cent relative humidity, and with field corn as food, the rice weevil had an average life span of about 4½ months; many individuals lived much longer and some attained an age of 480 days. Males lived about as long as females.

At 50 F and 80 (or above) per cent relative air humidity, rice weevils lived about as long as at room temperature, provided cracked or broken kernels or kernel fragments of field corn were present. Active feeding on the broken kernels was noted throughout the period of observations (140 days). The weevils did not reproduce at this temperature. If cracked or broken kernels were not present, most of the weevils died of starvation within 80 days; but a few lived considerably longer and were able to penetrate apparently sound kernels. At 50 F and 80 per cent relative humidity, but without food of any kind the weevils died within about 50 days. No doubt the harder types of popcorn would be even more resistant to feeding than field corn, under these conditions.

Discussion

Unprotected adult rice weevils died at 0 F in our experiments in about ½ hour. Somewhat longer exposures (1½ hrs.) were reported by Robinson, and much longer exposures (4 hours) by Back and Cotton. The differences are probably due to different strains of the test insect, and perhaps to differences in the experimental method. Most of the larvae and pupae in popcorn were killed in 16 hours and it is probable that all stages, including the eggs, would succumb to 0 F within 24 hours.

The granary weevil is reported to be more resistant to cold than the rice weevil. Thus, Back and Cotton and Robinson report 5 hours and 2½ hours respectively for complete kill of the granary weevil at 0 F; but a 24-hour exposure would appear sufficient to sterilize popcorn infested with this insect.

All stages of the confused flour beetle are killed by a 24-hour exposure to 21 F and they die in one hour or less at 0 F (Nagel and Shepard). The related red flour beetle, *Tribolium castaneum*, the Indian meal moth, *Plodia interpunctella*, and most other insects that may infest popcorn probably will be killed by about the same temperatures and exposures (Cotton).

After the popcorn has been freed of insects at 0 F, the temperature may be allowed to rise as high as 40 F for permanent storage. Clean popcorn will not be reinfested by insects if kept at or below this temperature.

Recommendations

The following suggestions are offered for the control of insects in popcorn by low temperature storage.

1. Clean the refrigerator room and remove all debris and old corn.

2. Remove all debris and cracked and broken kernels from the popcorn before it is placed in the refrigerator room.

3. Lower the temperature gradually on the stored corn until 0 F has been reached in the center of the corn; check this temperature with a thermometer. Then hold the temperature at 0 F for 24 hours.

4. After 24 hours have passed, allow the temperature to rise slowly to the temperature desired for permanent storage. This temperature should not be higher than 40 F.

5. When new corn is added to the treated corn, it should be clean and the sterilization procedure outlined above should be repeated.

Citations

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Robinson, W.: Low temperature and moisture as factors in the ecology of the rice weevil, *Sitophilus oryza* L. and the granary weevil, *Sitophilus granarius* L. Minn. Agr. Expt. Sta., Tech. Bull. 41, 1926.

Research Committee Recommends Enzyme Study

MORE comprehensive study of the enzyme systems in fruits and vegetables and their relationship to biological changes occurring between harvesting and processing and during storage of the unblanched frozen products, was urged by the Cold Storage Research Advisory Committee which met in Washington January 21-23. Established under authority of the Research and Marketing Act of 1946, the committee meets annually.

Among other principal recommendations of the committee were: Develop satisfactory products for the re-manufacture of concentrated apricot, peach and pear purees into baby foods; increase time - temperature tolerance study of fruit, vegetables and poultry in storage; make a fundamental study of the broad problem of packaging for frozen commodities, especially vegetables and poultry; extend the study of meat shrinkage in storage; establish in air-blast freezing the optimum air direction and velocity both in relation to the cooling of produce and to the air-blast freezing of various sizes of packages of produce frozen commercially; develop new techniques and storage for frozen bakery products; determine the effect of wholesale distributive methods, practices and facilities on the temperatures of frozen foods; and continue and expand educational programs on the importance of proper refrigeration for maintaining food quality.

The committee also recommended generally the maintenance of sustained research effort, together with the continuing and increased dissemination of research results. A complete report of the committee's recommendations was expected to be available for distribution about February 20.

Reelected during this meeting as chairman and vice chairman, respectively, of the committee were incumbents Paul B. Christensen, of the North East Cold Storage Corporation, Portland, Maine, and H. C. Diehl, of The Refrigeration Research Foundation, Colorado Springs, Colo. Other committee members attending the meeting were A. R. Current, City Products Corporation, Chicago, Ill.; Arnold T. Hampson, Merchants Cold Storage and Warehouse Co., Providence, R. I.; Harold J. Humphrey, General Foods Corporation, New York City, N.Y.; C. A. Martin, Sr., Polar Cold Storage, Inc., Nashville, Tenn.; Harlan J. Nissen, Terminal Refrigerating Co., Los Angeles, Calif.; S. C. Rogers, G. H. Hammond Company, Chicago, Ill.; and Len B. Wooton, Ninth Street Skookum Growers, Inc., Wenatchee, Wash. J. Roy Allgyer of the Agricultural Research Administration is executive secretary of the committee.

Extreme Temperatures Reproduced in Laboratory Testing Equipment for Armed Forces

Fig. 1—Opening one of the three stratosphere chambers in Bell Laboratories test lab for combat conditions. Inside the chamber temperatures can range from 200 to minus 100 F. Air pressure can simulate a climb from sea level to 50,000 feet and dive back to sea level in a few minutes. Humidity can shift from the dry cold of the Arctic to the steaming heat of a tropical jungle.

Fig. 2—Removing equipment from a stratosphere chamber where it has been subjected to the extremely low temperature it might encounter aboard a plane flying through the stratosphere. The chamber also provides a wide range of air pressure and humidity. (Photos courtesy Bell Telephone Laboratory)

A SPECIAL test center has been established by the Bell Telephone Company in a laboratory at Whippany, N. J., where complex, new electronic gear is being developed for the armed forces. Many of the rugged conditions of actual combat are created, including extremes of heat and cold. Engineers in the laboratory are able to subject models of proposed military equipment to the extreme conditions of field and combat service in which they may operate, whether on land, at sea or in the air.

Refrigeration Has Big Part in Tests

There is, for example, a sealed chamber inside which the pressure and temperature can be dropped to equal the thin air and sub-zero cold of the stratosphere. Then there is a giant hammer which drops down to reproduce a battleship's salvo. A platform loaded with aircraft equipment vibrates as if shaken by the engines of a huge bomber. Another platform, for seagoing gear, can be made to roll like the deck of a destroyer battling a rough sea.

These exhaustive tests enable Bell Laboratories engineers to design rugged, reliable equipment upon which men's lives and perhaps our national safety may one day depend. Refrigeration plays a very important part in these tests, according to J. C. Bayles, in charge of the Commercial Products Development Department of Whippany.

Of the three stratosphere chambers, one is the large unit shown in picture on front cover of this issue. This is a heat insulated steel structure reinforced by steel members to withstand the enormous total pressure on its outside walls, which may exceed four hundred tons when the air pressure inside the chamber is reduced to simulate high altitude conditions. Three multi-pane insulating windows permit visual observation of the operation of the equipment under test. Inside, the work space is six by seven feet in floor area and seven feet high, while outside dimensions are approximately eight by fifteen by nine feet.

A large door permits free access to the full width and height of the work space. The chamber is divided into two sections, separated by a partition with upper and lower tilting dampers. One section is the work space; the other contains the blowers for air circulation, the air-cooling coils, and the electric heaters. Air temperatures as low as minus 70 F can be attained when the electrical load of the equipment under test is as high as four kilowatts, and minus 94 F has been reached during some tests with light loads. Temperatures in excess of plus 160 F can be attained.

Humidifying

Humidifying apparatus provides relative humidities up to 95 percent at temperatures up to 160 F. To "flight test" equipment, the air pressure in the chamber can be reduced to simulate altitudes up to about 60,000 feet. Under normal testing conditions, the "rate of climb" averages 6,000 feet per minute up to 50,000 feet. This chamber has also been used to test special packaging methods designed to prevent the infiltration of moisture into containers while the equipment is stored in the holds of ships for trans-ocean shipment or in the warehouses in the tropics.

Fig. 3—For testing medium-sized apparatus and parts, a smaller altitude chamber has been provided. A man is shown checking equipment under test.

Fig. 4—A third chamber is used to test small apparatus and parts. Recording altimeter is being adjusted. (Photos courtesy Bell Telephone Labs.)

A second stratosphere chamber, Fig. 3, providing conditions similar to those of the larger chamber, has a work space about thirty by thirty inches and thirty-six inches high. It has been used primarily for testing component parts and small assemblies of the airborne radar type.

A third stratosphere chamber, shown in Fig. 4, also has a work space about thirty by thirty inches and thirty-six inches high, but cooling is accomplished by placing chipped "dry-ice" in a tank of Varsol (a commercial turpentine substitute), and then pumping the cold Varsol into a cooling tank in the top of the chamber. It is used for tests requiring temperatures between minus 40 F and plus 180 F, and relative humidities up to 95 percent at 150 F.

Multi-Stage Systems

According to A. A. Hoehling and Miss Elizabeth N. Bates, Publicationists, for the Laboratories, both refrigeration systems for stratosphere chambers in Figs. 3 and 4, are multi-staged systems. Reciprocating compressors are used in the first stage and centrifugal machines in the last stage. Refrigerants are Freon.

New Unit Produces Extreme Cold Temperatures

Another laboratory operated by Bell Telephone is at Murray Hill, New York, where Bell has in operation a Collins Helium Cryostat which the laboratories use in insulated chambers for testing materials.

Much can be learned about the nature of materials by studying their behavior in extreme cold. Several materials of great importance to the future of the telephone system are being studied at Murray Hill with the aid of this new refrigerating unit which by liquefying helium, produces temperatures close to absolute zero.

At very low temperatures materials exhibit striking changes in behavior which remain unexplained by theory. Tin, for example, develops extremely high electrical conductivity; set in motion by induction, a current continues to flow indefinitely without perceptible diminution. Studies of this "super conductivity" may further clarify the mechanisms of conduction, hence suggest ways of producing higher conductivity at ordinary temperatures. Circuits of higher conductivity than now available would be of great advantage in reducing attenuation and power consumption.

Admixtures of alloying materials markedly affect the conductivity of germanium, and the effect is different at very low temperatures than at room temperatures. Additional data obtained in extreme cold should help explain germanium's conductive mechanisms, and thus help improve semi-conducting devices such as germanium diodes and transistors.

Making Materials More Efficient

Another problem under attack is that of making ferro-magnetic materials more efficient at high frequencies. The properties of a ferromagnetic material depend on what happens to electron spins within the material. In turn the behavior of electron spins is revealed by resonance absorption bands which vary both in peak frequency and band width with the material's temperature. Absorption studies at very low temperatures are expected to reveal important new information as to the electron spin process.—Bell Laboratories Record.

Refrigerated Warehousing Industry

NATIONAL ASSOCIATION of REFRIGERATED WAREHOUSES

Division of American Warehousemen's Association

Executive Offices
TOWER BUILDING, WASHINGTON 5, D.C.

Executive Vice-president
WM. DALTON, WASHINGTON, D.C.

Secretary
JOS. H. COLQUITT, WASHINGTON, D.C.

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R. M. CONNER, CHICAGO, ILL.

Treasurer
CHAS. B. HART, TACOMA, WASH.

THIS MONTH IN BRIEF

The American Warehousemen's Association issues first call for the 62nd Annual Meeting to be held at Washington, D. C. May 17-21. The National Association of Refrigerated Warehouses and The Refrigeration Research Foundation will hold their annual Meetings in conjunction.

Cold Storage holdings for January showed a slight decline for coolers and one point above average for freezer occupancy.

The training conference for warehouse personnel held at St. Louis February 1-5 was attended by 62 operating men from the Missouri Valley. The next conference, will be held at San Jose, Calif., March 15-19.

The Fact Finding Conference of the Institute of American Poultry Industries held at Kansas City February 14-17 covered a wide range of problems and interests of the poultry industry.

AWA Sounds Call for 62nd Annual Meeting

THE "Official Call" has sounded. Registrations are starting to pour in for the 62nd Annual Meeting of The American Warehousemen's Association being held at the Shoreham Hotel, Washington, D. C., May 17-21.

With a new administration in power in the convention city and controls about to be scrapped along with some other government restrictions, interest in this year's annual meeting is at an all-time peak.

NARW will again feature its popular panel sessions. Experts, comprising the panels, will generate lively discussions on all phases of refrigerated warehouse operations. Warehousemen are urged to bring their problems along and toss them in the hopper.

Preliminary social plans include many and varied entertainment functions. The President's reception will be held in the Congressional Room of Washington's Hotel Statler, followed by the Annual Dinner in the famous and beautiful Presidential Room.

Headquarters at Shoreham

Convention headquarters is the fabulous Shoreham Hotel—"The Resort Hotel of the Nation's Capital." Situated away from the city proper in Washington's beautiful northwest section overlooking Rock Creek Park, the hotel contains 1,105 rooms and fourteen ballrooms, dining places, assembly halls and cocktail lounges. Weather permitting, AWA'ers will officially open the hotel's Terrace dining and dancing area for the summer season.

Early registrants can take in the big Eastern Sprint Champion Regatta, Saturday, May 16. Sponsored by the Eastern Association of Rowing Colleges, thirty-two crews from various colleges around the nation will be competing in nine races over a 200 meter course. Feature attractions will be the famous Navy crew—Olympic game champs—and the 101st annual meeting between those age old rivals, Harvard and Yale. Tickets may be obtained from AWA Headquarters, 608 Tower Building, Wash., D. C.

Sightseeing trips to the many historic sights in and around Washington are being planned now. Also, a special program for the ladies, featuring a host of social functions, is in the making.

Over-all this year's annual meeting is shaping up to be the best in

Tentative AWA Schedule

SUNDAY, MAY 17
6:00 P.M.—Welcome Hour (Dinner and Time Open)

MONDAY, MAY 18
9:30 A.M.—AWA Opening General Session
12:15 P.M.—Divisional First Timer's Luncheon
2:00 P.M.—Divisional Sessions
6:00 P.M.—Delegates free to explore Washington at night

TUESDAY, MAY 19
9:00 A.M.—Divisional Sessions
2:00 P.M.—Divisional Sessions
6:00 P.M.—Reception
7:00 P.M.—AWA Family Party—entertainment and dancing

WEDNESDAY, MAY 20
9:00 A.M.—Divisional Sessions
2:00 P.M.—Divisional Sessions
6:30 P.M.—President's Reception, Congressional Room, Hotel Statler
7:30 P.M.—62nd Annual Presidential Dinner, Presidential Room, Hotel Statler

THURSDAY, MAY 21
9:00 A.M.—Divisional Sessions
12:30 P.M.—AWA Closing Luncheon

Special ladies program featuring unusual activities afforded by Washington Convention.

AWA's history. Lively business sessions, crammed with profit-making ideas, coupled with the best in entertainment assures a well balanced, profitable and enjoyable meeting. Reservations sent in now are receiving priority treatment by the Hotels. Rooms at the lovely Wardman Park Hotel—just around the corner—are also available to AWA'ers.

NARW Convention

Convention planning for the National Association of Refrigerated Warehouses got underway in earnest January 27 when members of the NARW staff met at luncheon with Clarence Arata, Manager, Greater National Capitol Committee, Convention and Tourists Bureau of the Washington Board of Trade. General arrangements, publicity, specal features, entertainment, registrations, etc., all came in for discussion.

TRRF Annual Meeting

The Refrigeration Research Foundation annual meeting will start Friday, May 15 with an open session of the Advisory Council, continuing Saturday. The membership meeting will be held Sunday, May 17.

AWA President Announces Annual Convention Plans

AN announcement by J. L. Gagini, general president of the American Warehousemen's Association says a cordial invitation has been extended to all members of the association and their ladies to be on hand for the big 62nd annual convention.

This, he says, is going to be an exceptional convention. In addition to an outstanding business program, designed with the interests and pocketbooks of the members in mind, it has been planned with the objective of providing an unusual opportunity for members and their families to explore the many beautiful and historic features of the nation's capital, to see and discuss the national government in action under the new administration. Both the business and social programs will be chock-full of special features which only a Washington convention can offer.

Hotel reservations and advance registration forms have been mailed to all members, along with instructions for their use. This will provide an opportunity for all to make their reservations simultaneously.

Department of Agriculture To Be Reorganized

THE United States Department of Agriculture, largest of all the Nation's civilian agencies, swollen into a huge bureaucracy of 20 agencies and bureaus in the last 20 years, is getting a major overhauling.

Ezra Taft Benson, Secretary, has announced that he is re-grouping the Department's services into four divisions for administrative purposes. Another division, the Solicitor's Office, will remain as presently constituted.

"This action," stated Benson, "will make possible a closer coordination of related activities. All the regrouped agencies retain their present structure with the exception of the Agricultural Conservation Program. This will be transferred from the Production and Marketing Administration and placed with the Research, Extension and Land-Use Group.

"What we intend is a gradual streamlining of the Department's services in the interest of economy and greater efficiency. The action is taken after weeks of study and conferences with congressional leaders, the members of the President's Committee on Re-organization, our own Interim Agricultural Advisory Committee, and members of the Hoover Commission."

Here are the four groups, the agencies in each, and the officials who will head them:

Commodity Marketing and Adjustment Group; John H. Davis, President; Commodity Credit Corporation, Commodity Exchange Authority, Federal Crop Insurance Corporation, and Production and Marketing Administration (except Agricultural Conservation Programs branch). Transportation and Warehousing will remain under P&MA in this group.

Agricultural Credit Group; Romeo E. Short, Assistant to the Secretary; Farm Credit Administration, Farmers Home Administration, and rural Electrification Administration.

Research, Extension and Land-Use Group; J. Earl Coke, Assistant Secretary of Agriculture; Agricultural Research Administration, Bureau of Agricultural Economics, Extension Service, Forest Service, Office of Foreign Agricultural Relations, Soil Conservation Service, and Agricultural Conservation Programs Branch (transferred from PMA).

Departmental Administration Group; Richard D. Alpin, Assistant to the Secretary; Hearing Examiners, Library, Office of Budget and Finance, Office of Information, Office of Personnel, and Office of Plant and Operations.

The four group heads, along with Secretary Benson; True D. Morse, Under Secretary; Karl D. Loos, Solicitor; the executive and administrative assistants and such consultants as are designated will form a policy forming and planning group that will meet weekly to chart the course of the agricultural administration, according to Mr. Benson. — NARW Quick Sheet

Toledo Warehouse Observes Twenty-fifth Anniversary

ORGANIZED in 1928, the Great Lakes Terminal Warehouse Company, Toledo, Ohio, this year celebrates its 25th Anniversary. Special attention is being called to the occasion throughout the year with special releases, as are appropriate, to their customers, friends and the general public. They call attention to the "years of service" factor among their employees and indicate that their average employee has been in service with them approximately 15 of their 25 years in business.—Cold Facts.

Turkeys in Storage in NARW Warehouses

REPORTS from 209 warehouses to the Institute of American Poultry Industries show that 63 had no turkeys. The remaining 146 houses reported a total of 89,866,174 pounds in storage at the close of business January 31, 1953. Of this amount 1,286,233 pounds were unclassified.

The balance, 88,579,941 pounds, held in 146 warehouses in 97 cities in 31 states, and Washington, D. C., shows the following table.

This report, it is explained, covers NARW members only, and in no way replaces the USDA monthly report which will show total holdings.

TURKEYS HELD IN NARW WAREHOUSES

	Pounds	% of Classified Total (88,579,941)
Eviscerated tom turkeys	48,374,531	54.61%
Eviscerated hen turkeys	8,844,889	9.97%
Eviscerated broiler-fryer type turkeys	1,242,463	1.40%
N.Y. Dressed tom turkeys	22,975,371	25.98%
N.Y. Dressed hen turkeys	7,142,687	8.04%
TOTAL	88,579,941	100.00%

Report on Storage Space—A Correction

WE REGRET to announce that the chart on page 22 of the January issue of ICE AND REFRIGERATION, showing cities with three or more public refrigerated warehouses with two million or more cubic feet net piling space, appears to have a number of errors. This chart was furnished as part of a report on refrigerated storage capacity in the United States by the Production and Marketing Administration, Transportation and Warehousing Branch, United States Department of Agriculture. However, a New York correspondent points out a number of inaccuracies as follows:

Rochester, N. Y., is credited with approximately 7,500,000 to 8,000,000 cubic feet of net piling space, whereas it should be about 1,351,000 cubic feet of gross space.

Geneva, N. Y., is credited with between three and four million cubic feet of net piling space, whereas it should be about 244,000 cubic feet of gross space.

Buffalo, N. Y., is credited with having about three million cubic feet of net space, whereas it should be about four mililon of gross space.

Medina, N. Y., is credited with around two and one half million cubic feet of net space, whereas it should be about 650,000 cubic feet of gross space.

Attention of the Department of Agriculture was called to this, with request for corrected or verified figures, which brought the reply which follows. We greatly regret this misunderstanding, and hope the explanations given above and below will serve to explain the record with respect to the cities listed. Editors, ICE AND REFRIGERATION.

Department Explains

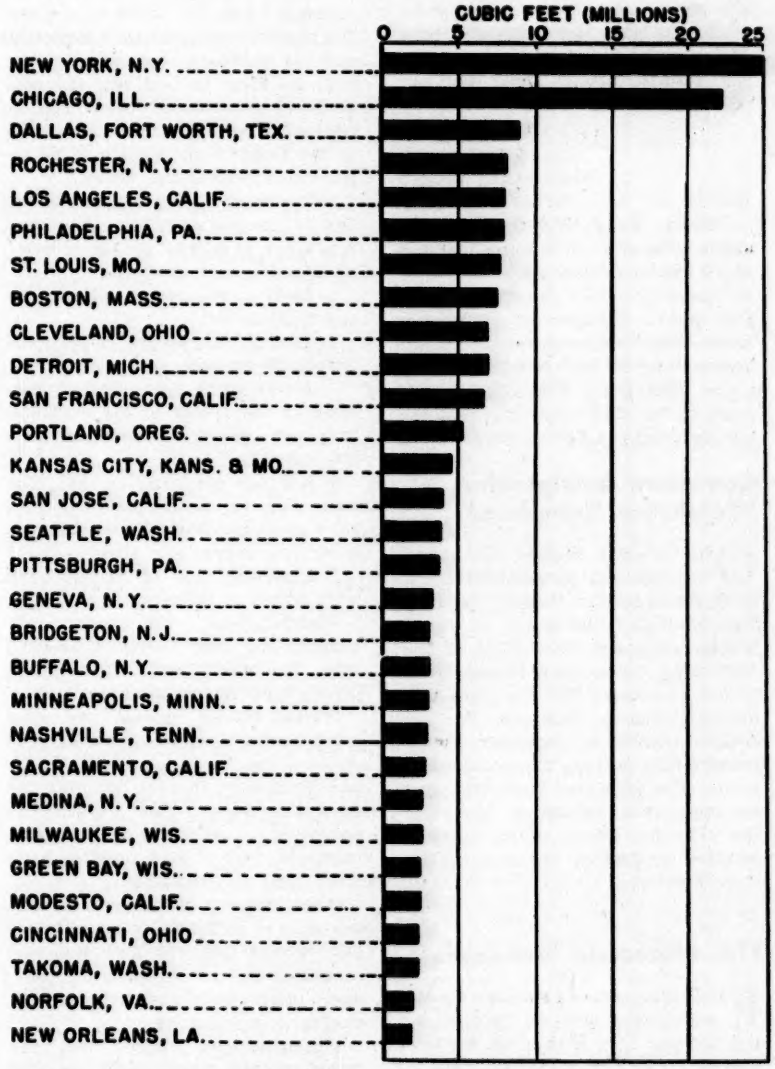
Note: After the above article had been prepared and set in type, the following letter was received from the Director of the Transportation and Warehousing Branch of the United States Department of Agriculture.

Ice and Refrigeration
433-435 North Waller Avenue,
Chicago 44, Illinois.

Your letter of January 27, 1953, addressed to the Secretary of Agriculture, has been referred to this Branch for reply.

Upon examination of the warehouse capacities listed in your letter, we found that in every instance they were almost identical to the warehouse space reported by the National Association of Refrigerated Warehouses in their Directory of Public Refrigerated Warehouses. This leads us to believe that you and your correspondent used this publication to check the accuracy of the data published in our 1951 survey. However, these two reports are not directly comparable since the trade association's report on warehouse space in Rochester, Geneva, Buffalo and Medina, New York, is limited to its members in the aforementioned cities, whereas our tabulation of warehouse space in these cities includes members and non-members alike.

The question raised by your correspondent regarding the accuracy of our 1951 survey, particularly with respect to warehouse space in selected cities, stems from figure 4 (page 22) which appeared in your January issue of Ice and Refrigeration. This chart, depicting warehouse space in cities with three or more public refrigerated warehouses, with two million or more cubic feet, was intended to be a reprint of figure 9 (page 35) in our publication but, unfortunately, it is not a faithful reproduction.



Reproduction of chart published in January issue showing cities of three or more public general refrigerated warehouses with two million or more cubic feet net piling space October 1, 1951. NOTE: Includes the city and surrounding territory within a radius of 25 miles.

Enclosed is a copy of our 1951 survey and your attention is invited to the table chart appearing on page 34 and 35. You will note that both the table and chart contain a footnote as follows: "Includes the city and surrounding territory within a radius of 25 miles."

This reference was omitted in your reprint of our figure 9 and, therefore, your presentation of city warehouse space (figure 4) overstated the capacity in each instance.

In fairness to your readers and to the Department, it is requested that you issue a corrected version of figure 4 in your next issue of Ice and Refrigeration so that our 1951 survey will not be viewed with suspicion by those who have not received a copy of our report but learned of our survey results through your publication.

Very truly yours,
Transportation and
Warehousing Branch

(NOTE: The NARW to which the above letter refers has a membership which represents between 85 and 90 percent of the total amount of available public refrigerated warehouse space. There are however some small houses, mostly one crop outfits, in places like those mentioned which could throw off the overall coordination between the figures quoted.)

Romanian Refrigerated Warehouse Completed

ONE of the biggest and most modern refrigerated warehouses in the Romanian Peoples Republic was completed last month in Targu Mures, administrative center of the Hungarian Autonomous Region. Most of the equipment for the plant was manufactured in Romania. The big freight elevators, however, were made in the German Democratic Republic. The plant had been scheduled for completion in March 1953, but the intensive efforts of its builders resulted in beating the schedule by three months.

Fire Protection Standards

FIRE protection standards for warehouses will be revised by the National Fire Protection Association as a result of a meeting held in New York January 23. The meeting was called to discuss possible changes in the current fire protection standards for warehouses issued by NFPA.

Wirebound Wooden Box Best for Frozen Poultry

REFRIGERATED warehousemen prefer the wirebound wooden container, with liners, as the best all-around type container for quick freezing of poultry, according to a report by the Warehouse Operations Committee of the National Association of Refrigerated Warehouses.

James J. Gallery, committee chairman and manager, Quincy Market Cold Storage & Warehouse Co., Watertown, Mass., pointed out in his report that warehousemen favor this type of container because it can be stacked higher without fear of crushing or sliding, and consequent better satisfaction to the customer and the public.

"This is especially important," he claimed, "with the trend to modern, single-story refrigerated warehouses and the increasing use of pallets for high stacking. In addition, the contents of wire bound boxes can be frozen quicker—a decided advantage in the stepped up operations of refrigerated warehouses today."

Although endorsing the wire bound box as the best available, the report was quick to suggest means of overall improvement, such as:

1. Make containers of uniform size and construction.
2. Limit gross weight to approximately 80 pounds.
3. Insert some type of reinforcement in the center of the container to insure against crushing, and permit storage on end.
4. Improve markings so that contents can be easily identified—i.e., color markings in the form of stripes signifying grades and sizes.
5. Eliminate use of second-hand wire bound containers.

Warehousemen, the report continued, are particularly concerned over the rising costs in handling mixed cars or trucks of poultry.

Mixing classes, grades, and sizes when loading the cars or trucks, produces a real handling headache for warehousemen. Besides doubling the time of unloading, more experienced personnel is needed for checking this particular type of load, boosting handling costs substantially.

Other findings of the survey revealed that individually packed turkey cartons seem to give the best protection to the product, but produce many problems in handling, storing, and checking.

Warehousemen suggest that the turkey people make larger units of these turkey cartons by strapping four or six together of the same grade product, and marked with the gross weight. This would be a big step toward faster and more efficient handling, storing, and checking.

The ideal container, in the opinion of refrigerated warehousemen, is one that can be stacked high without crushing or tipping over the stack, and constructed in such a manner as to permit quick freezing of the contents properly, and without damage to the box or the contents.

New Refrigeration Plant To Serve Fishermen

A REFRIGERATION plant on the docks at Morro Bay, Calif., is planned by General Refrigeration Service, of Santa Maria, to service the catches of the Fishermens Association of Morro Bay, Inc. The plant will handle the cargoes of more than 150 small and large boats bringing in loads of albacore and sardines from the deep sea outside Morro Bay.

Owners of the General Refrigeration Service are J. P. Lapp and B. J. Piercy, who have been in the fish icing business for many years.

The new plant will be equipped to service the refrigeration equipment of fishing boats which heretofore have had to sail to other ports to get needed repairs to their cold-pack systems which enable them to remain at sea for extended periods while building up pay-cargoes.

Allman Retires

AFTER thirty-three years with the U. S. Cold Storage Co., where he has been Chairman of the Board of Directors, G. Dudley Allman has retired from refrigerated warehousing. An honorary member of NARW, Mr. Allman will consult with the management and Board of U. S. as needed, but he has resigned from active duty. Mail still reaches Dud through the Chicago Executive Office of U. S. Cold Storage.— Cold Facts.

Senate Names Members of Agriculture Committee

THE United States Senate has named the members of its committee on Agriculture and because this is the committee with which warehousemen are apt to be most frequently concerned its entire membership is listed:

Republicans: Aiken (Vt.), Chairman; Young (N.D.); Thye (Minn.); Hickenlooper (Ia.); Mundt (S.D.); Williams (Del); Schoeppel (Kans.); Welker (Idaho).

Democrats: Ellender (La.); Hoey (N.C.); Johnston (S.C.); Holland (Fla.); Anderson (N.Mex.); Eastland (Miss.); Clements (Ky.) — NARW Quick Sheet

January 31 Cold Storage Holdings

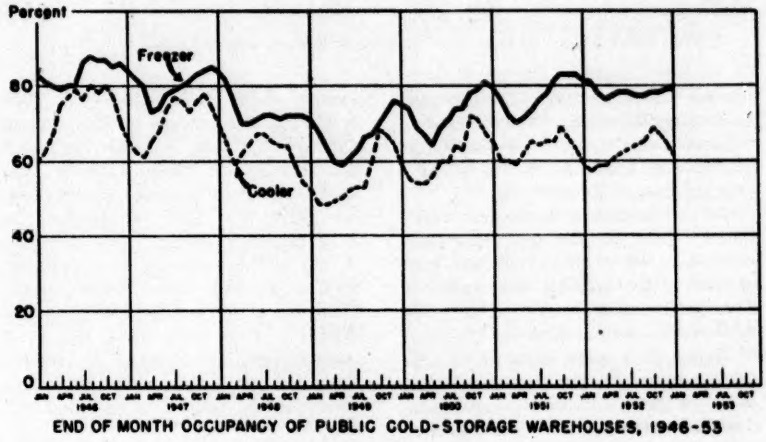
ON JANUARY 31, cooler and freezer occupancy in public refrigerated warehouses was 61 and 79 per cent, respectively, according to reports received by the Department of Agriculture. During January, cooler occupancy declined three points, which was about average for the year. The end-of-month occupancy was also equal to the January 31, 5-year average level but when compared with last year, cooler occupancy was two points above the January 31, 1952 level of utilization. Freezer occupancy was above the January 31, 5-year average by one point. In several States, however, freezer occupancy was above 85 per cent, particularly in the East North Central, West Uorth Central, South Atlantic, East South Central, and Mountain Regions.

Cooler net weights reflected a seasonal decrease of 14 per cent during January as fresh fruits, dried and evaporated fruits, cheese, shell eggs, and dried eggs, moved from storage. Moving into storage were nuts and nut meats, beef, pork, sausage, and canned meats, but these net accumulations did not counter the net withdrawals which totaled over 300 million pounds, thus leaving 1.9 billion pounds in store on January 31. Seasonal accumulations of butter, beef, pork, sausage, and juices more than offset the net withdrawals of frozen fruits, vegetables, cream, poultry and frozen eggs. The total freezer weight of 2.4 billion compares with 2.3 billion last year and average January 31 stocks of 1.9 billion pounds.

National holdings of apples reported in storage on January 31 totaled 15 million bushels as compared with 20 million bushels a month earlier. Last year this time, there were 16 million bushels in storage while average January 31 stocks were 20 million bushels. January net withdrawals were about a million bushels less than average and the 1952 net change. Less than a million bushels of pears were in storage on January 31, according to warehouse reports. This amount, while less than average, was greater than last year's stocks.

A greater than average January net disappearance of frozen fruits brought total stocks down to 258 million pounds. The 29 million pound seasonal net withdrawal, although about equal to the change last year, was 20 per cent greater than average. Total holdings, however, were below last year's stocks by 45 million pounds and below average by 32 million pounds. All frozen fruit items except apples reflected seasonal net withdrawals, with the greatest change being reported in holdings of strawberries — a decrease of 16 million pounds. Holdings of strawberries, though down to 91 million pounds, were 26 million pounds above average for this time of year and were 6 million pounds greater than the last year's stocks.

Frozen orange juice holdings re-



END OF MONTH OCCUPANCY OF PUBLIC COLD-STORAGE WAREHOUSES, 1946-53

TABLE 1—COLD STORAGE HOLDINGS IN PUBLIC, PRIVATE AND SEMI-PRIVATE WAREHOUSES, APPLE HOUSES AND MEAT PACKING PLANTS (000) LBS.)

	Jan. 31 1953	Dec. 31 1952	Jan. 31 1952	Five-year Average
Meat and meat products, lbs.	1,035,244	921,974	1,096,345	958,148
Lard and rendered pork fat, lbs.*		124,073		
Frozen poultry, lbs.	259,676	278,595	300,000	264,484
Creamery butter, lbs.	87,503	72,723	13,874	44,999
American cheese, lbs.	194,514	205,178	167,824	141,372
Other cheese, lbs.	19,248	21,130	17,861	15,922
Shell eggs, cases	115	153	238	223
Frozen eggs, lbs.	34,867	50,176	53,055	66,647
Apples, bu.	15,275	20,061	16,014	19,838
Frozen fruits, lbs.	257,775	286,995	302,751	290,181
Frozen vegetables, lbs.	490,569	534,933	444,409	335,179
Frozen fish, lbs.	169,742	192,818	148,113	128,838

* Effective with this report lard and rendered pork fat will no longer be reported.

TABLE 2—PERCENTAGE OF SPACE OCCUPIED BY PUBLIC COLD STORAGE WAREHOUSES (APPLE HOUSES EXCLUDED)

	Net piling space (000 cu. ft.)		Jan. 31, 1952 (%)		Dec. 31, 1952 (%)		Jan. 31, 1952 (%)		5 year Average (%)	
	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer
New England	2,687	6,358	36	73	39	76	45	83	52	82
Middle Atlantic	28,324	32,959	58	77	67	81	58	82	59	77
East North Central	27,290	26,844	62	83	60	84	63	85	63	80
West North Central	8,194	19,322	56	82	58	79	53	87	66	87
South Atlantic	9,410	11,047	65	72	68	69	64	86	60	83
East South Central	2,475	3,514	78	86	71	88	64	92	68	85
West South Central	7,109	8,714	73	75	70	62	61	63	62	67
Mountain	1,213	1,984	52	89	58	78	57	90	55	78
Pacific	16,616	27,472	60	75	68	79	56	75	59	72
United States	103,318	138,214	61	79	64	79	59	81	61	78

TABLE 3—PERCENTAGE OF SPACE OCCUPIED BY PRIVATE AND SEMI-PRIVATE REFRIGERATED WAREHOUSES AND MEAT PACKING PLANTS (APPLE HOUSES EXCLUDED)

	Private and Semi-Private Warehouses						Meat Packing Establishments					
	Net Piling Space (000 cu. ft.)		Space Occupied—per cent Jan. 31, 1953		Jan. 31, 1952		Net Piling Space (000 cu. ft.)		Space Occupied—per cent Jan. 31, 1953		Jan. 31, 1952	
	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer
New England	6	7	50	50	50	50	61	—	—	—	—	—
Middle Atlantic	1,279	1,418	43	67	40	80	1,077	301	91	81	65	79
East North Central	3,348	5,203	73	69	74	78	4,462	985	91	80	89	95
West North Central	228	1,873	67	71	87	77	6,502	4,812	89	96	92	94
South Atlantic	58	4,438	35	50	69	61	432	182	100	100	87	100
East South Central	—	—	—	—	—	—	67	74	100	100	100	94
West South Central	19	—	—	—	—	—	294	160	100	100	100	100
Mountain	470	—	—	—	—	—	166	107	100	100	84	98
Pacific	2,687	3,525	46	57	41	74	1,351	245	74	92	95	92
United States	8,113	16,481	57	61	59	72	14,412	6,867	89	93	90	94

NOTE: Blank spaces indicate that insufficient returns were received.

flected a gain of almost 50 per cent as January 31 stocks totaled about 15 million gallons. Last year, orange concentrate holdings totaled 10 million gallons on January 31.

Net withdrawals of frozen vegetables while 20 per cent less than last year, were almost 16 per cent greater than average for January. Frozen vegetables reported in store totaled 491 million pounds. Holdings of frozen peas were reduced 18 million pounds during January; lima beans, 9 million pounds; snap beans, 6 million pounds; corn and spinach, each reflected a 5 million pound net withdrawal. Although total January 31 stores of frozen vegetables were at an all time high for the month, stocks of lima beans, snap beans, Brussels sprouts, and corn were not.

Holdings of creamery butter increased by 15 million pounds during January, thereby bringing total holdings up to 88 million pounds. This increase was the first ever recorded during January and total holdings were one of the largest on record since 1916 for January 31.

Holdings of American cheese were at an all time high for January 31 with 195 million pounds reported in storage.

Shell eggs on hand totaled 115,000 cases as compared with 238,000 cases in Storage January 31, 1952. Frozen egg stocks, which totaled 35 million pounds on January 31, were one of the smallest on record for the month in the past 24 years.

Poultry holdings were reduced during January by 19 million pounds, leaving about 260 million pounds in store. This net disappearance compares with 2 million last year and 7 million during January in the 5-year period ended 1952. Turkey holdings were down to 143 million pounds which compares with 102 million pound average for January 31 and 116 million pounds in store last year.

January net accumulations of beef brought national holdings up to 266 million pounds by the end of the month. This compares with 240 million last year and 172 million on hand January 31 during the 5-year period ended 1952. Stocks of pork increased 102 million pounds during January but this increase was about one-fourth less than average and about one-third less than the increase last year. The seasonal increase in pork holdings brought total holdings to 591 million pounds of which 388 million pounds were frozen pork. Holdings of all meats totaled over a billion pounds and, while not at a record high for January 31, represents the ninth time since 1916 that total meat holdings have equalled this mark.

By January 31, holdings of all fishery products decreased to 188 million pounds. The seasonal net disappearance of 26 million pounds was comprised of 23 million pounds of frozen fish and shell fish, and 3 million pounds of cured fish. Stocks of 170 million pounds of frozen fishery products compares with 148 million in store last year and 129 million on hand January 31 during the 5-year period ended 1952.

Storage Outlook

Cooler occupancy, which began its seasonal decline during last November, should continue to fall off during February. According to the 5-year average change and the change last year, the expected decline is 4 points. Freezer occupancy, too, should decline during February, if the 5-year average pattern prevails. However, with near record holdings of meats and butter and above average holdings of frozen vegetables, freezer occupancy may not decline as much as in the past and may even be the same as the level reported on January 31.

Private Warehouses

PRIVATE Refrigerated Warehouses are now operated by 56 percent of food plants according to a survey by "Distribution Age". The survey also showed that about two-thirds of these plants also use public refrigerated warehouses; that 50 per cent of these public warehouses were used for local distribution, 25 percent for regional distribution and the balance are used in connection with national distribution programs. Food plants using public warehouses said they were generally satisfied with the service they were receiving.—Cold Facts.

Price Controls Removed

AN ORDER has been issued by OPS removing price controls for warehousing, storage, dock and terminal services. The industries decontrolled by this action need not make or keep records on future transactions. However they must keep available for inspection whatever records were required by the price regulations under which they have been pricing.

"Quick Sheet," issued by the National Association of Refrigerated Warehouses, in an explanatory note accompanying this announcement, says there will be numerous "hardship" cases where rate increases may be mandatory on specific commodities. The Association has informed the government however that these instances would be kept to a minimum and that as a result, no effect on the present inflationary-type economy will be noticeable.

Chapter Meetings

MEETINGS of Chapters of the National Association of Refrigerated Warehouses have been announced as follows:

North Atlantic Chapter: March 11 and 12, with a banquet the first evening, at Commodore Hotel, New York City; Summer meeting at the Skytop Lodge in the Poconos, September 23-25.

Southwestern Chapter: March 9 and 10 at the All States Hotel, Houston, Texas, with a boat ride the first afternoon.

Missouri Valley Chapter: Meeting at the Omaha Athletic Club, Omaha, Neb., March 19.

South Pacific Chapter (Pacific States Cold Storage Warehousemens' Association): Meeting at the Hotel Del Coronado, Coronado, Calif., April 22-24.

Training Conference on Warehousing Problems Draws Big Attendance and Interest

SIXTY-TWO operating-staff men from refrigerated warehouse companies in the Missouri Valley attended the training conference February 1-5 in Jefferson Hotel, St. Louis. Sponsorship and direction were joint responsibilities of The Refrigeration Research Foundation and the National Association of Refrigerated Warehouses.

Approximately a hundred are expected to attend a similar conference, which has been planned for Pacific Coast operators March 15-19 at San Jose, Calif. Registrations are coming in also for the North Atlantic conference to be held April 12-16 in Baltimore. The National Association of Refrigerated Warehouses, 608 Tower Bldg., Washington, D.C., is handling registrations.

That size of group r ·es for very effective training, according to H. C. "Dutch" Diehl, Director of the Foundation, because the twenty or more in each of three discussion groups have excellent opportunity for discussion of problems. Several years ago the Foundation conducted eleven such regional conferences over the United States and Canada.

The NARW, which is jointly sponsoring and aiding the new series of training sessions that began in St. Louis, was represented by its Executive Vice President William A. Dalton, who, in addition to administrative duties, conducted a session on Customer Relations.

The essential and valuable service of the training conference, as emphasized by "Dutch" Diehl, is the thorough discussion of problems and principles. Sub-groups of 15 to 20 and up to 35 or 40 are workable. After stimulating talks by discussion leaders in the forenoon in meetings of the whole conference, these groups meet separately in the afternoon for their session of discussion. Here problems and practices get a thorough give-and-take analysis and the questions that seemed to be one-sided often turn out to have several angles, some of which may be very useful. Dutch believes that discussion not only brings out new facts but also trains the individual who takes part.

On Sunday evening, February 1, the entire group was entertained by refrigerated warehouse companies in the immediate area at a cocktail party at Hotel Jefferson. Al Versen, secretary of the Missouri Valley Chapter of the NARW, a very genial host and well known to all, was instrumental in making this get-together a success and a valuable preliminary to the training conference sessions on the following days.

Some of the highlights brought out in the St. Louis conference follow:

Summary of Discussions

The discussions on Mechanical Handling, led by Walter O. Thompson, Jr., of Modesto, Calif., pointed up the need for acquaintanceship with all the various systems and use of all of them where needed. It was an excellent presentation. There was urgent expression of need for more consideration of this subject, especially for multi-story warehouses.

The sessions on Basic Factors in Refrigeration and Humidity Control, led by Regis Gubser, covered a broad range of operational practices and principles and more could have been covered if time had permitted.

A. R. Carstensen of Sacramento, Calif., led discussions and showed his motion picture of safety appliances and his company's rather unusual and successful safety program. This is a comparatively new subject and although all the answers are not in the record, progress is being made.

W. C. "Bill" Baker of Chicago really laid it on the line in an evening session on warehousing costs. He presented a clear and logical stepwise procedure for the calculation of the cost of operating a cubic foot of refrigerated space, and also for the calculation of the revenue that each cubic foot is producing. It's a complex subject but Bill reduced the complexity with marked skill and revealed its basic importance to successful operation of a warehouse.

Bill Dalton widened the horizons of the subject of Customer Relations and introduced a large number of simple and effective practices that are bound to be helpful to warehouse operators. Phil Kuehn, discussion leader on the subject of Employee Relations, brought a lot of experience and valuable assistance from his home plant in Milwaukee. Phil is a devoted student of this subject and had much to offer, and did it very effectively.

Kenneth Stepleton of Chicago, ably handling the discussions on Selling Warehouse Service, stressed the many factors in service that build confidence in storers of goods. Most of the selling job, he said, is done right inside the warehouse because there you perform the service that builds your reputation for ability and integrity.

Second Evening Session

In a second evening session Dr. Mallmann of Michigan State College in his usually interesting manner gave the group an excellent review of basic factors as well as problems and new developments in Sanitation and Good Housekeeping. Dr. Mallmann has an enviable record, not only as a research worker and teacher but also as a popular lecturer and has served in a similar capacity in many of the Foundation's previous training conferences.

During the third day, the subjects were storage and handling practices for large classes of commodities. J. L. Gagini of Omaha drew on his years of experience as well as his knowledge of technical phases of poultry storage in leading the discussions of that subject.

Jim Kuehn of Milwaukee ably led discussions on dairy products and dwelt especially on changes that have come and are coming in that field. S. C. Rogers of Chicago provided sound and practical advice in his leadership of the discussion on meat storage. Dr. Kenneth Dykstra, who directs research for Birds Eye Division of General Foods Corp., was on hand to conduct an evening session on storage and handling of frozen foods and reviewed the basic reasons for specific handling and storage practices.

The fourth day covered new and important subjects. Jack L. Urban of Los Angeles provided a wealth of evidence, including an excellent series of pictures, to show that fisheries products are really new and large in potential volume and that the old technical problems are being solved. Buck Mills, also of Los Angeles, crammed a lot into his session on Dock Inspection of Commodities and Reefer Trucks and Cars. This subject is gaining recognition as one having industry-wide importance because it defines responsibility and offers opportunity for considerable managerial skill and technical know-how.

On this last day there was also a session on New and Miscellaneous Products in which Dutch, Lou Ash-

(Continued on page 52)

Fact Finding Conference Points to Ways Of Building Better Busines

ATTRACTING a good attendance the 24th annual Fact Finding Conference was held at Kansas City, Mo., February 14-17 by the Institute of American Poultry Industries. In addition to the poultry men the conference attracted a number of warehousemen and allied industries.

Of special interest to refrigerated warehouse operators was a discussion of production keeping up with the demand by Dr. B. T. Shaw, United States Department of Agriculture. Dr. Shaw said that to meet the needs of the increased population American farmers will have to produce about 30 percent more by 1975. In the poultry industry this would call for more than one billion additional pounds of poultry and meat and more than one and one-half billion additional dozen of eggs. To do this he said the industry will have to make more use of the information developed by research.

George Jansen, Jansen Packages, Inc., pointed out that customer service had shown that in addition to protecting quality the modern poultry package must have top consumer appeal. Continuing the discussion of packaging, Dr. George F. Stewart, University of California, called attention to the increased marketing of poultry in ready-to-cook form and that this called for better and more attractive packaging.

In a panel discussion of distribution systems Charles W. Frank, L. Frank and Company, Inc., called attention to the fact that present demand from housewives is for fresh ice-packed ready-to-cook poultry, most of them preferring this to the individually packaged frozen product.

Proper handling of eggs, according to Hobart Creighton, Creighton Brothers, calls for use of a holding room with temperatures at 55 F and humidity at 75. Previously the eggs should be cleaned and graded and then moved from the holding room into the handling and packaging rooms where they are graded and cartoned for sale.

Benjamin R. Harris, The Emulsol Corporation, discussing liquid and frozen eggs said the industry last year used about 77 million pounds of liquid and frozen eggs to produce about 2.5 million pounds of whole egg solids, about 7.8 million pounds of yolk solids and about 6.5 million pounds of white solids.

In a paper on using inplant chlorination in chilled poultry operations Dr. M. Wayne Miller, Washington Cooperative Famers Association, said that after storage at 35 F for two weeks, birds that had been dipped in water containing 1,000 parts of free chlorine per million for thirty seconds, before they were chilled in ice water prior to cutting up, had about one-tenth the bacteria count as untreated birds. At end of 18 days they showed slight off-odors while the untreated birds were decomposed.

In a panel discussion on egg quality, Professor E. M. Funk, University of Missouri, said that if they could hold all eggs under suitable refrigeration from production to consumer they would solve 90 per cent of their present quality problems in shell eggs. Experience has shown that Midwestern soiled eggs which have been washed and pastuerized or thermostabilized keep remarkably well in storage.

A number of other papers were presented and discussed, of specialized interest to members of the poultry industry. These included Selling Methods; A Sanitation Program, Controlling Waste, Financing and Credit Problems, Duck Merchandising, Broiler Profits, New Products, Serving the Market, Housewive's Preference, Buying and Selling Relationships, Successful Business Management, Developing Qualified Men for Key Positions and Scalding Temperatures.

Massachusetts Warehousemen

THE Massachusetts Warehousemen's Association held their annual meeting in Boston on January 21. Annual reports were made by various committee chairmen, including Herbert Farnsworth, Chairman, "Port of Boston Committee," and various merchandise storage warehousemen. Elected to the Executive Committee for the coming year was Edward W. Hathaway of Commonwealth Ice & Cold Storage, Boston.—Cold Facts.

How to Control Odors

THE Bureau of Standards it is reported has issued a twelve page booklet entitled, "Control of Odors". "The best solution", it concludes at the end of the twelve pages, "is to find the material that is the source of the odor, and remove it, if possible." —Cold Facts

USDA Turkey Purchase Program Closes

THE U. S. Department of Agriculture has announced the end of the surplus removal program for 1952-crop turkeys, launched August 26, 1952, under which purchases amounted to 48,435,461 pounds, after adjustment for unconfirmed acceptances, at an estimated total cost of about $26,113,-335. Total purchases of frozen, ready-to-cook turkeys under the program represent about six per cent of the all-time record crop of about 59 million birds produced last year.

The turkeys are being donated by USDA to non-profit school lunch programs and other eligible outlets. No purchases were made January 27, the final offer date, because the quantity already available to the Department is sufficient to provide fully for the requirements of these outlets.

The purchase program was made effective to provide an outlet for temporary surpluses of turkeys which, during the major marketing season, were causing unfavorable prices to producers. The purchases were made with Section 32 funds provided by Congress to encourage consumption of agricultural commodities by diverting surplus quantities from normal channels of trade.

The quantities purchased by months and the average prices paid for grade A eviscerated turkeys per pound, are as follows: October, 3,383,430 pounds at 51.95 cents; November, 9,961,938 pounds at 53.88 cents; December, 14,-761,000 pounds at 54.64 cents; January 2,480,343 pounds at 53.71 cents; February, 13,972,000 pounds at 54.20 cents; and March, 3,876,750 pounds at 53.29 cents. The national average price for all Grade A turkeys was 54.03 cents a pound.

The average monthly prices and the estimated total cost are based on purchases of Grade A turkeys. Consequently, the final cost will be slightly less than the estimate, because vendors were permitted to include up to 30 per cent Grade B birds in their offers. These brought 3 to 4 cents a pound less than Grade A turkeys.

Pacific Northwest Chapter Elects Officers

HOLDING its annual meeting recently in Seattle, Wash., the Pacific Northwest Association of Refrigerated Warehousemen elected Alex Olsson of Portland, Ore., as the new president for the ensuing year. New vice president is R. D. Lamb of Weston, Ore., and William T. Baker of Seattle, continues as secretary-Treasurer.

Practical Refrigerating Engineer

NATIONAL ASSOCIATION PRACTICAL REFRIGERATING ENGINEERS

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Evaporator Coil Design

J. F. DALY
Manager Ice Plants
A.T. & S.F. Railway Co.

IN comparatively recent times the production of frozen foods has developed into a major industry, calling for new techniques in the processing and freezing of the product.

It is necessary to accomplish the freezing in a short space of time, at a high rate of cooling, requiring new conceptions in system designs. In meeting this condition, a new field has opened for refrigerating engineers in arriving at designs different from those of the past.

While not so spectacular in growth, the accelerated need for precooling and storage of non-frozen products has demanded increasing ingenuity on the part of the engineer.

This paper will cover one phase of these developments—the design of coils having a high rate of heat pick-up, with the handling of air in quantities necessary to promote rapid product cooling, quick freezing, or adequate storage conditions. The three coils to be described were designed for use in large plants.

A paper presented by J. F. Daly, Manager Ice Plants, The Atchison, Topeka & Santa Fe Railway Company, November 13, 1952, at the national convention of the National Association of Practical Refrigerating Engineers, at Dallas.

Fig. 1 shows a coil similar to one used in a plant having a freezing capacity of 250 product-tons per day. This coil serves a row of tunnels with a total daily freezing rate of 170 tons of food. It is made from 1¼ inch pipe with two spiral fins per inch. The total surface is nearly 35,000 square feet, with a ratio of secondary to prime of 8.8 to 1.

Ammonia is the refrigerant, and the coil normally operates at 3.2 inches vacuum, or minus 32F. With one fan per tunnel, the total air circulation is about 240,000 cubic feet per minute and the face velocity is 655 feet per minute. Each 1¼ inch outlet provides slightly over one ton of refrigeration, the whole coil delivering about 169 tons.

No Return Bends

It will be noted that there are no return bends and that each path is short. The pipes are pitched one-eighth of an inch per foot. The high air and refrigerant velocities give this coil a "K" factor of six or more

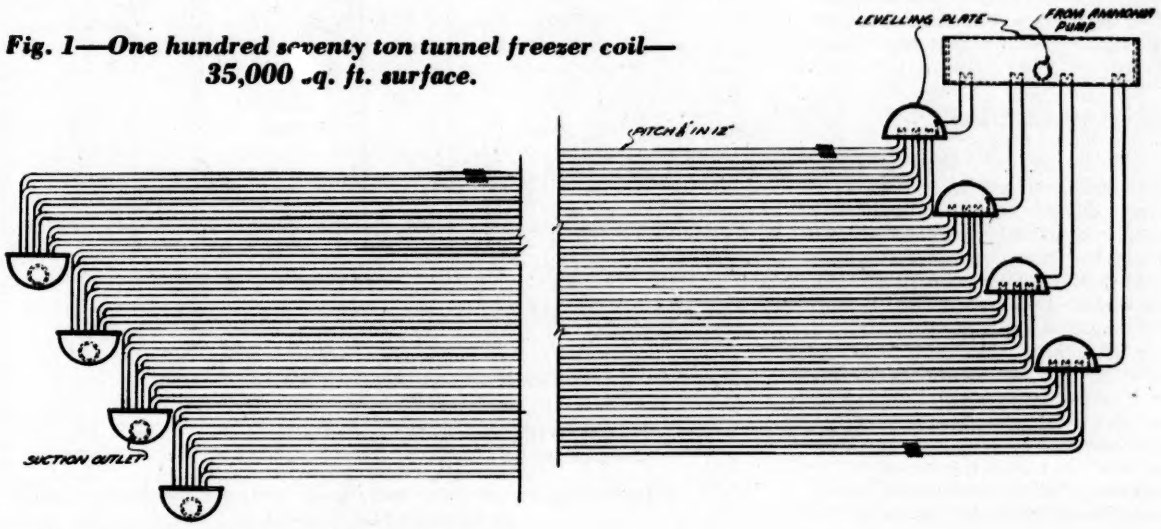


Fig. 1—One hundred seventy ton tunnel freezer coil— 35,000 sq. ft. surface.

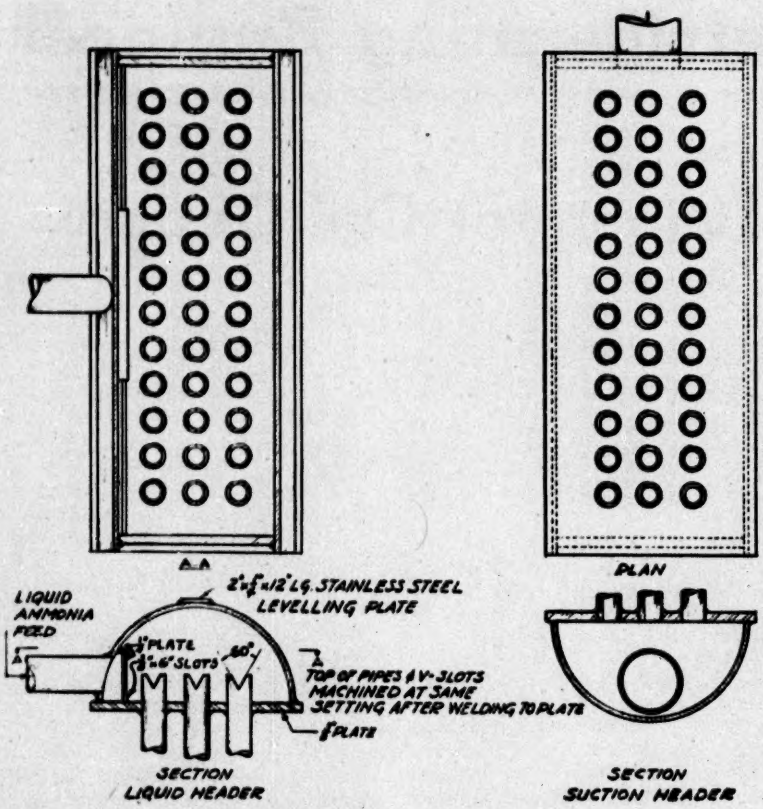


Fig. 2—Liquid and Suction Headers for Freezer Coil shown in Fig. 1.

Btu's per hour per square foot per degree.

The coil is very simple and has no valves, flanges, threaded connections, or any fabrication except welding, in the coil chamber. Another advantage is that with the self-draining feature the coil can be defrosted in about thirty minutes.

It may be observed that the ammonia in the main liquid header is equally distributed to sub-headers—four in this case—and again equally distributed to the individual short runs.

Equal Distribution

The method of obtaining equal distribution is shown in Fig. 2. A large diameter pipe is split into halves, with the ends and bottom closed by welded plates. The individual pipes extend equally through the bottom plate. V-notches are carefully machined in each pipe, with all V's at exactly the same level. A leveling plate can be provided to assure proper installation of the header so that each pipe receives precisely the same amount of liquid, regardless of how much is being circulated. A slotted baffle prevents wave action from affecting the uniform feeds. The pressure losses and uncertainties involved in distribution by orifices are eliminated.

This figure also shows a successful means of installing the suction outlets. Each run is substantially identical with respect to feed, length, and outlet, so that each pipe does its equal share of the work.

Fig. 3 illustrates the control of the refrigerant. A rather conventional accumulator with a float control is employed, but the ammonia is circulated by means of a liquid pump. Particular attention was given to maintaining low velocities in the pump piping and to avoid abrupt changes in direction. Cavitation had been a problem in some installations, but by using a pump which nominally has a high capacity, and by operating it at much less than its rated speed, excellent performance can be obtained.

In fact, investigation disclosed that petroleum refineries had encountered cavitation difficulties long ago in handling products of a highly volatile nature, such as propane and butane, and had solved the problems by the same means—that is, by providing large passages and avoiding low pressure regions brought about by constrictions and abrupt changes in flow direction.

The pump should be selected to circulate approximately six times

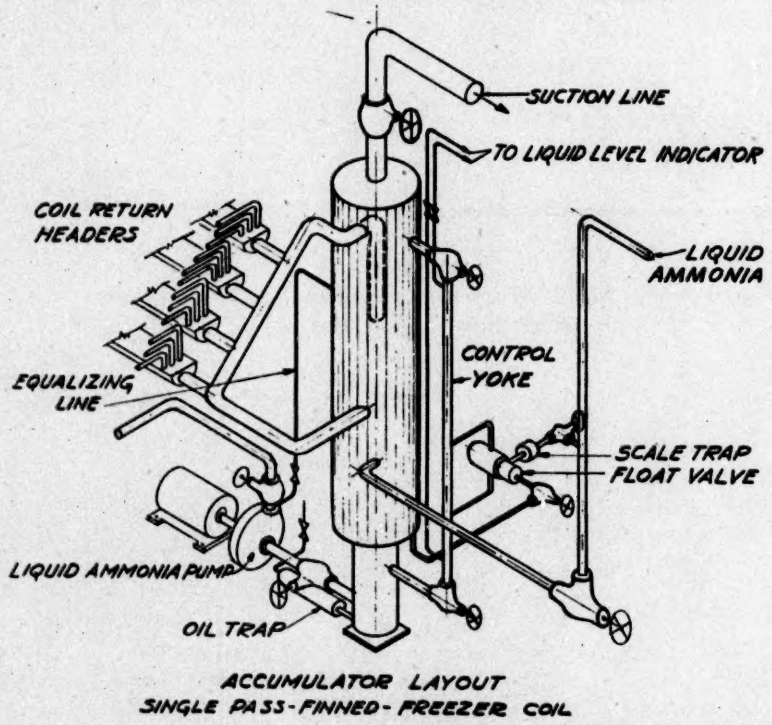


Fig. 3—Isometric of Accumulator and liquid pump for headers and coils pictured in Figs. 1 and 2.

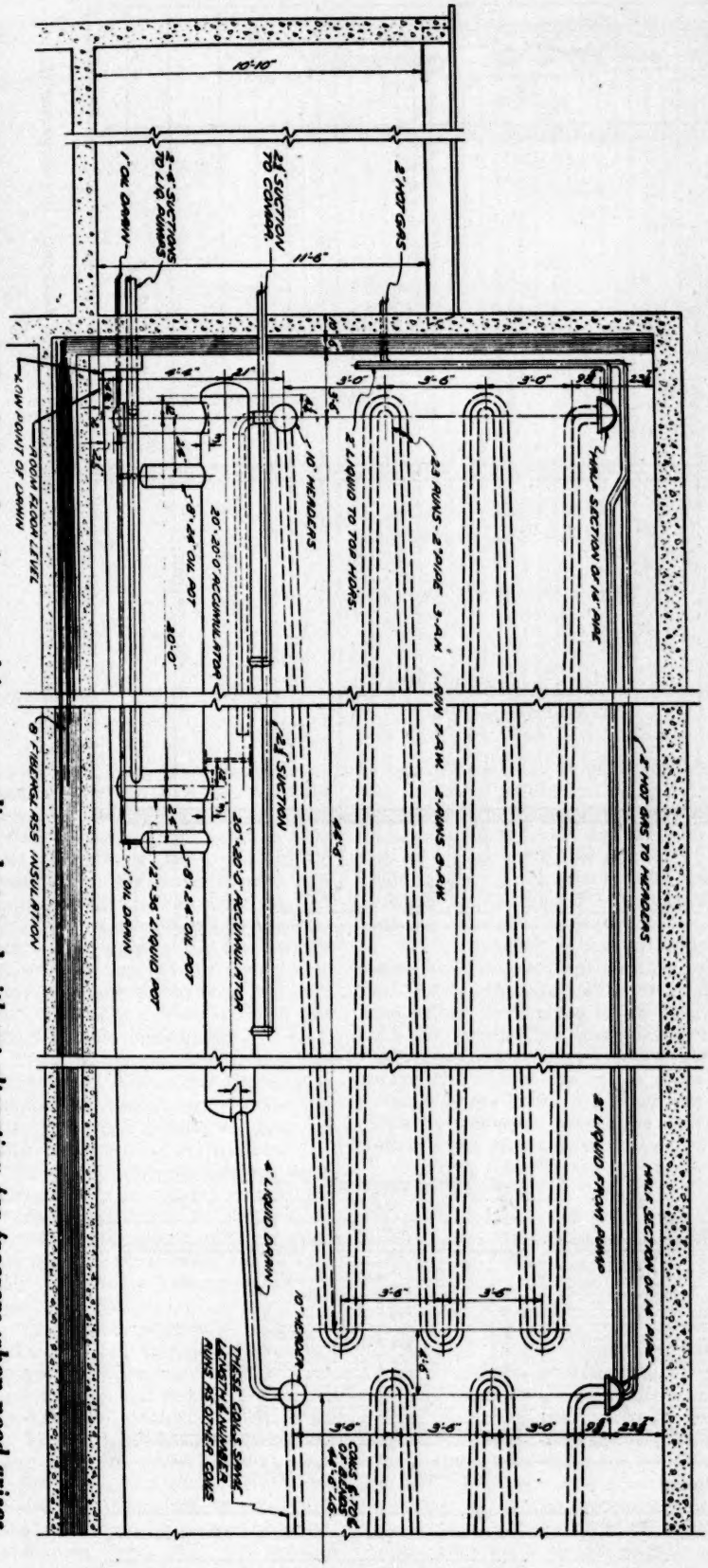


Fig. 4—Double duty pipe coils; designed and operated for precooling, but used without alteration for freezers when need arises.

the amount of ammonia evaporated in the coil, or around 75 gallons per minute in the particular coil described. The liquid control maintains a definite, positive pressure on the pump suction, while preventing the filling of the accumulator to the detriment of good liquid separation.

Recirculating Coil

Another design which has given splendid results is shown in Fig. 4. This is a re-circulating coil, also. In this case, there are over 13,500 feet of 2-inch black pipe on one separator, for a total of nearly 8,500 square feet of surface, all prime. Again, the runs are pitched for fast liquid movement.

Equality of feed through all circuits is maintained by the use of V-notches in the pipes, as described previously.

Hubbell regulators are used on the coil shown and the liquid pump circulates several times more ammonia than is evaporated.

The coil, it will be observed, is divided into two similar portions to reduce the length of the refrigerant paths, with each portion operating from its own half of the long, divided accumulator.

In one installation this divided arrangement worked out very advantageously, for a very practical reason. Although it actually serves one large room, the method of handling of product in and out has the effect of operating two rooms.

Freezer Storage Use

This coil was originally designed for precooling and for holding fruit at 31 F., but the increased freezer demand has brought about its use for freezer storage, where it has served very well, as would be expected, because there are no fundamental differences between it and the first coil.

The design called for 110,000 cubic feet per minute of air vertically through the coil.

The specification required about 38 tons of refrigeration, which permitted a fast rate of precooling and provided ample surface for maintaining a low temperature difference between the evaporating ammonia and circulating air to obtain close humidity control when holding non-frozen product.

When this coil is performing at its design rate with 29 F. evaporating

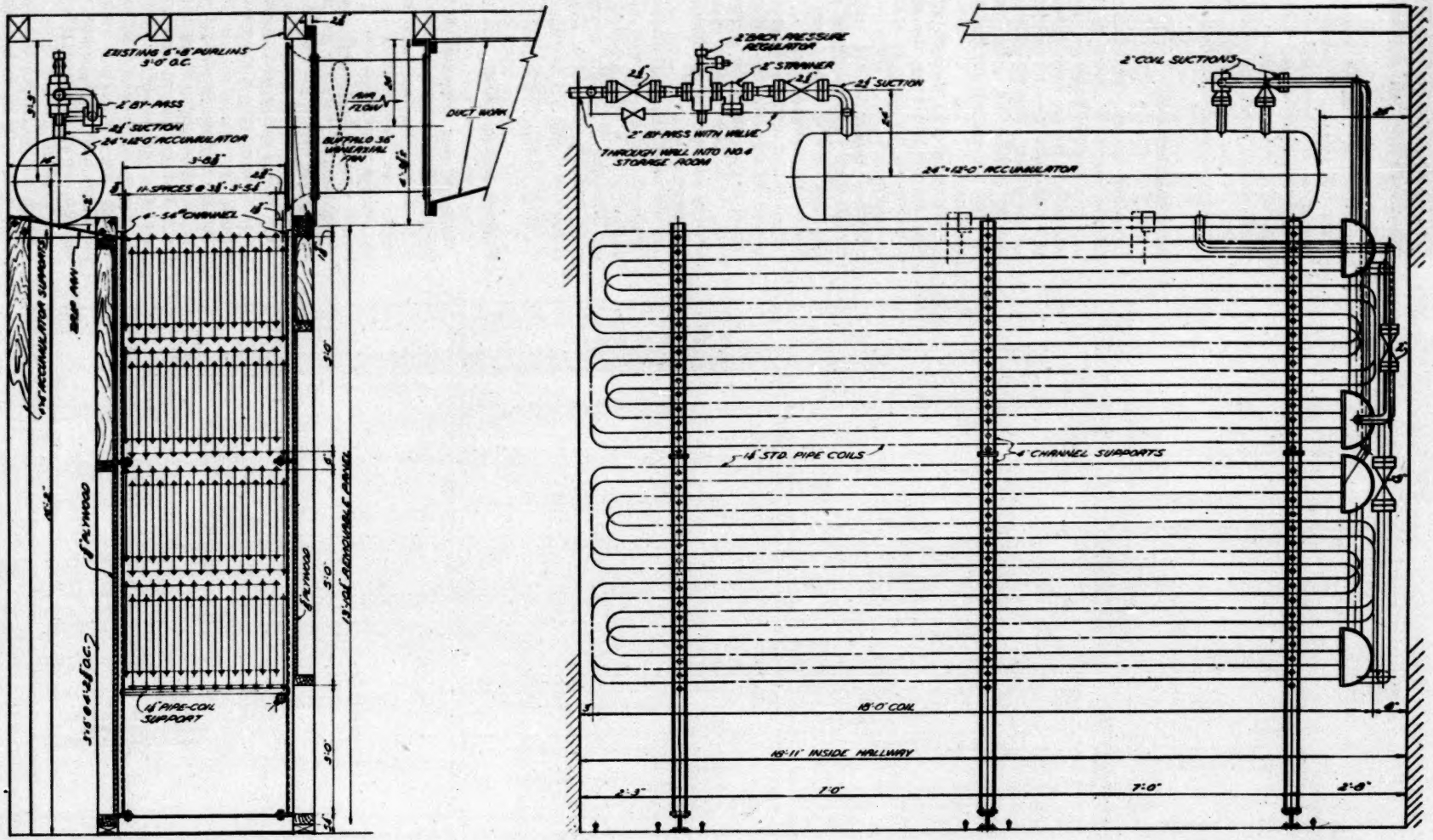


Fig. 5—Another variable duty coil—may be used for precooling of fruits or produce storage—Note two-part arrangement.

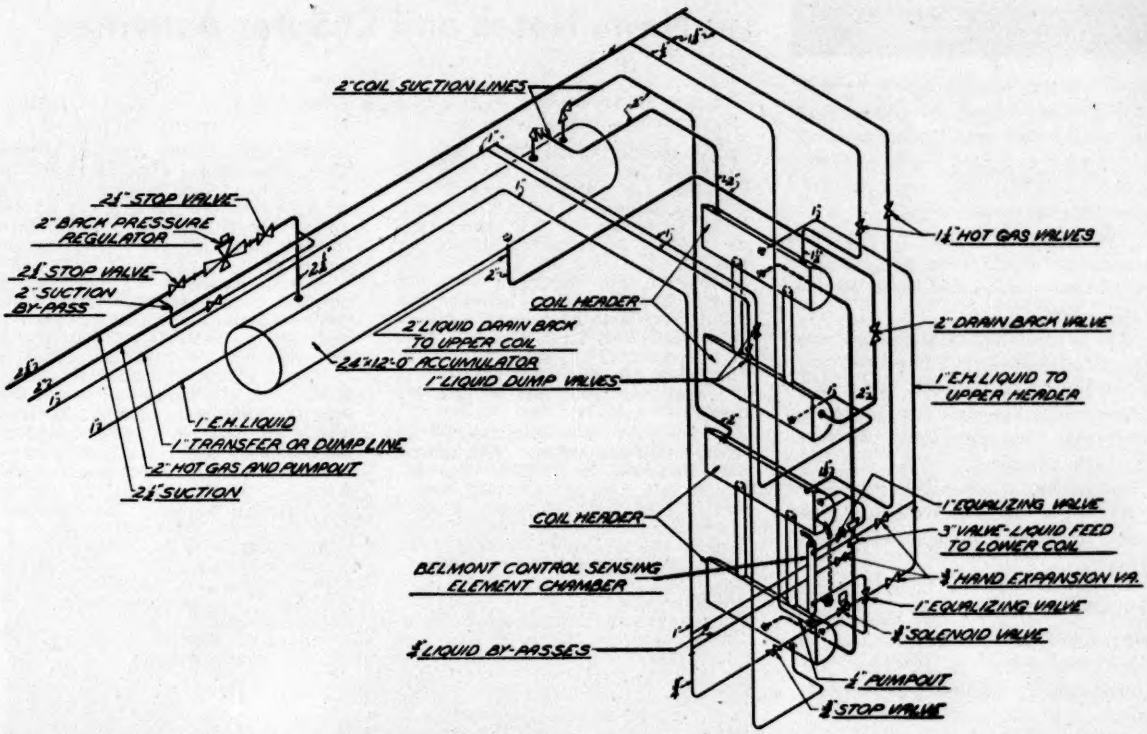


Fig. 6—Isometric of piping arrangement for coil shown in No. 5. Droplegs between half-shell headers promote good circulation.

temperature the vapor velocity at each of the two inch outlets is 74 feet per minute. The outlet vapor velocity of the first design is 980 feet per minute when the coil is operating at 3.2 inches vacuum and approximately its maximum rate. At first, this appears to be quite a disparity, but actually the low density of the low temperature gas induces very low pipe friction and for each coil the pressure drop through the short circuits is negligible.

The tons per outlet, or pounds per minute, for each of the two coils is comparable despite the velocity differential, when specific volumes and pipe cross-sections are considered.

This emphasizes the fact that when sizing the pipe and arriving at the number of outlets to be employed in a coil, the operating conditions should be carefully considered, as gas density as well as velocity influences pressure drop.

The rate per outlet is a measure of efficiency and economy when compressor capacity, quality of product, cost of pipe, cost of fans, and power charges are weighed. A rate of 0.8 to 1.0 ton per outlet has worked out well in some recent installations.

Fig. 5 shows a design which embodies an interesting feature. It is used in a room for precooling grapes and other fresh fruit, but produce can be stored for long periods, if desired, because there is ample surface to maintain close differentials throughout the system. For precooling, about 40,000 cubic feet per minute of air with 528 feet per minute face velocity is circulated, but the volume can be reduced when only a storage room load is carried.

A re-circulating system with an ammonia pump was not installed on this job, as the seasonal nature and the rather small scope of the plant did not warrant the employment of highly trained personnel, and it was thought, too, that the design represented in the figure was more suitable for automatic night-time operation when the plant is unattended.

It will be seen that the coil is relatively short and high. This results from limited floor space and the fact that it was installed in an existing room.

Coil in Two Parts

The coil actually consists of two separate parts, one above the other. It would have been quite simple to make this as one coil, but in flooded operation there would have been a large static head on the refrigerant in the lower runs, with a saturation temperature at the bottom one or two degrees higher than in the upper pipes, resulting in limited pick-up at the region of the warmest air. For the close temperature and humidity control required for grapes, this would be quite significant. An additional advantage lies in maintaining short circuits.

The liquid is fed into the top coil, but the control operates from the lower coil. When the control calls for more liquid, the ammonia enters the upper header of the upper bank, filling the header until a level is reached at which the excess liquid overflows through a 3-inch line to feed the lower group, in an attempt to satisfy the liquid level control.

The suction from both coils enters the common separator. It will be observed that, particularly in the early stages of precooling when temperature splits are high, the lower portion of the coil will do most of the work and evaporate most of the refrigerant, leaving the upper half to do the finishing up.

Isometric Diagram

Fig. 6 shows an isometric diagram of the piping serving a coil like the one just discussed. In an evaporator of this type large drop legs are used between the upper and lower headers to promote good circulation within each section. If desired, the upper coil alone can be used by valving off the lower coil.

Air velocities over the coil of 600-

800 feet per minute result in good "K" factors; higher velocities, while increasing the heat transfer, result in pressure losses, with greater power costs and with more air friction heat to be removed.

Use of finned surface merits consideration where high refrigeration rates are involved and space for the coil is limited.

The type of surface finish is sometimes overlooked, but is particularly important where products are gassed. Considerable research toward development of a suitable protective coating is underway.

Lubricating oil should be carefully selected and adequate oil traps provided to prevent impairment of heat transfer.

Variations of the three designs shown can be devised to fit any condition encountered, bearing in mind the following principal requirements in obtaining good operation:

Requirements For Good Operation

1—Short runs should be used, to reduce pressure drop and to keep all the surface working.

2—Pipes should be pitched to promote good liquid velocities.

3—Liquid or static pressures should be kept low.

4—Careful consideration should be given to the refrigerating effect, or pounds of refrigerant per outlet.

5—Separators should be large and well designed to insure fully flooded coil operation, while permitting dry, but nearly saturated, vapor to reach the machines.

6—In a liquid pump system the pump capacity should exceed the normal evaporating rate by a liberal margin, to maintain fully wetted surfaces and to allow for periods of above-normal requirements.

7—For economical installation and operation, liquid distribution must be equal to all circuits.

8—For economical operation, ample surface must be provided; liberal amounts of surface are doubly important where high humidities are to be maintained.

9—No matter how skillfully the coils are designed, proper quantities of air must be circulated to obtain optimum "K" factors at the coil, to maintain uniform temperatures in a stored product, or to effect quick cooling or freezing of a fresh product.

News Notes and Chapter Activities

Chicago

JOHN FORTI

THE second regular meeting of the month of January for Chicago Chapter, was called to order 7:15 at Chicago Engineer's Club, 314 South Federal Street. Plans were announced for the annual Ladies' Night, this year honoring Mr. and Mrs. Jay R. Watson, for Jay's 30 years of service to the Chicago membership. This affair is to be held at Landas' Cafe, 5660 West Lake Street, 7:30 p. m., February 17, 1953. Tickets for this affair are $3.25 per person and are available from any of the officers.

Clyde Stovall was appointed to the membership committee by President Bert McKenna. E. B. Kelly was accepted into Chicago Chapter membership. Mr. Kelly is assistant chief engineer of the U. S. Post Office, Canal and Van Buren Street Station.

A discussion was held on the Annual Convention to be held at Purdue University. Chicago Chapter has pledged its support to Professor Venneman in every way.

Lecture course was continued by Mr. Eugene Rytlewski of Westerlin & Campbell Company. Use of water regulating valves was discussed. This valve is used for controlling amount of water used for condensing—be it city water, well water, or cooling tower water. Use of this valve saves water and conserves pumping costs. Mr. Rytlewski stressed the use of two water regulating valves in parallel, with a hand by-pass. This arrangement provides a smaller valve for winter operation (if supply water temperature is not constant) and a larger valve for summer or peak load operation. A regulator should be a floating control in the line, according to Mr. Rytlewski, and should not be over or under-sized.

At the February 3 meeting, two new members were accepted for membership. The chapter welcomed William L. Ellzey, field engineer and pipe fitting foreman for Piping and Refrigeration Contractors of Chicago, and Thomas J. Jerkowsky, operating engineer for Fuhrman & Forster Co., Chicago. Both were elected to active membership.

President McKenna announced that Professor H. G. Venemann, National Educational Chairman, would be the Master of Ceremonies for Jay Watson Night.

Three questions were submitted on electrical problems and were assigned to Bill Tiffin, Ideal Electric Company, J. E. Watkins and Ed. Garnaas of Midwest Engineering Company. The questions will be answered at the March 17 meeting.

Chairman of the speaker's committee, J. E. Watkins, introduced the guest speaker, Wilburt K. Schroeder, representing the Socony-Vacuum Co. Mr. Schroeder gave a very interesting talk on "Lubrication"—illustrated with colored slides.

Several different makes of compressors were shown and the various oiling methods were discussed—splash, force feed, chain, etc. Fans and motors were also discussed and it was recommended that they should be greased approximately every six months with a good grade of grease. The procedure for greasing should be as follows: Open bottom plug, fill with new grease (forcing out all old grease). Run for five minutes then replace plug. Do not get grease on windings.

A good example was cited as to how oil may reduce friction. Tests were made with a 5 inch shaft and a load of approximately 8,400 lbs. A dial indicator was mounted on top of the shaft. With the shaft revolving at 200 rpm, shaft rose .001 in.; at 400 rpm the shaft rose .002 in.; at 1200 rpm shaft rose .003 in. The speed of the revolving shaft forces oil underneath it, actually floating the shaft. A very good tip handed out was to use a good grade of oil for compressors, bearings and even in automobiles, and stick to it. Do not mix oils of different manufacture, due to the various solvents or agents used. This may have a clashing effect and prove to be very costly.

Colton

H. O. BONTER

THE first meeting of California Chapter No. 5, in 1953, was held January 14, at the Santa Fe Ice Plant lunch room, San Bernardino, Calif. The meeting was very well attended in spite of the bad weather. Fourteen members and one prospective member came from various parts of the valley to attend the meeting. The speaker from the Fiberglass Co. was unable to be present. However, the group had a round table talk on the business matters of the chapter for the coming year, the educational program and the speakers.

After the business session, the new officers were elected for the year. They are: President, T. C. Bangs; 1st Vice-President, H. J. Mintert; 2nd Vice-President, Carl L. Hooker; Secy.-Treas., H. O. Bonter; Sgt.-at-Arms, J. E. Finfrock; Directors, Alvie Miller, F. J. Scherer, C. H. Purkiss, and F. J. Scherer is the Educational Instructor.

San Jose

LEONARD E. ABBOTT

AT the regular meeting of San Jose Chapter on January 12, our new instructor, Professor S. Brooks Walton, took over the refrigeration course. He certainly aroused a great deal of interest in his first appearance for the chapter. Professor Walton is an instructor in mechanical engineering at the San Jose State College.

San Jose Chapter is in the process of drawing up a 1953 calendar of events and expects to make some startling announcements in this respect at the next meeting.

At the last meeting Bob Roberts informed us that he has moved from Erin Way to Dry Creek Road, which many Irishmen present couldn't understand. John S. Preble also announced he had relocated from Locust Street to Holly Drive, in keeping with the season.

St. Louis

K. M. HOLADAY

THE NAPRE course on Basic Refrigeration continues to be the backbone of St. Louis Chapter's educational program. Instructor John Dabbs brings home the point of the lessons by lecture, demonstration, blackboard drawings, quiz problems, and discussion of local plant problems. At the meeting of January 19, plans were announced to augument the class sessions by special programs on alternate meeting nights. There was also some discussion of tentative plans by the Executive Committee for the annual spring meeting at which new officers for the next fiscal year are to be elected. A number of interesting suggestions were made for making this an attractive social affair that will appeal to all members.

St. Louis Chapter Officers, 1952-53: John Dabbs, director and class instructor; Lester Lanser, sergeant-at-arms; Stan Tatalovich, secretary; Eugene Kessler, vice-president; Charles J. Wunderlich, president; Eugene Bishop, director; R. W. Acey, treasurer.

A membership roster drawn up by committeemen and financed from dues funds, was recently distributed, but it did not include a listing of committee assignments. President Charles Wunderlich therefore repeats his announcement of appointments as follows: Educational Committee, John Dabbs, chairman, Robert Best and Charles Good; Membership Committee, Eugene Bishop, chairman, Arthur Thomas, Jeff Thomas and Stan Tatalovich; Auditing Committee, Harold Suter, chairman and Ed Hughes; Nominating Committee, Ken Holaday, chairman, Les Fleiter, Ed Lotte and John Dabbs; Entertainment Committee, Ed Lotte, chairman, Stan Tatalovich and Les Fleiter.

Attention was called to the regulation established by the National Board of Directors that members whose dues for the current year are not paid during the first quarter must be stricken from the active roll and from the ICE AND REFRIGERATION subscription list. Treasurer Ernie Acey announced that dues have been paid by nearly 40 percent of the members during the first two weeks of the year.

Seattle

FLOYD BURRIS

ON JANUARY 20, Washington Chapter No. 1 enjoyed the hospitality of Superintendent Bob Rittenburg at Rainier Ice & Cold Stg. Co., plus the help of Bob Swope, and Chet Bertus who operate there. They took us all through the plant, explaining it in detail, and then finished off the evening with coffee and doughnuts in the Cedergreen Lunchroom in the plant. We had a large group on hand. It looked good to see Vince Kauffman, Manager of N. W. Baker, there.

A trip is being arranged to the Civic Ice Arena Thurs., Feb. 26th through the courtesy of member Bob Hutchinson, Chief Engineer. The winners of the membership contest were Loren McRae and Mervin Schmitz who finished in a tie, therefore they each received half a year's dues free. We have received applications from Earl Hylton, Refrigeration Mechanic at the Navy Pier 91, sponsored by Gil Hickok, Chief Engineer of Navy Plant and Owen Lee; and M. Edwin Hollenbeck, a boiler fireman employed very recently at Sunshine Biscuit Co., until they closed their Seattle plant. He is sponsored by John Williams.

Speaking of new members, the president and secretary attended the January meeting of the North Pacific Chapter of the National Association of Refrigerated Warehouses, at the Washington Athletic Club. They presented to the owners and managers of the warehouses in Washington and Oregon what the NAPRE has to offer in training new engineers for them and making better engineers of those they now employ, thus making for better and more efficiently operated plants, and more members for the Seattle Chapter. Chet Bertus' talk was well received, and by following up with personal contacts we have already gotten results. Several men at Rainier Ice Co. who haven't been active for a few years have sent in their dues. Arden Farms will have to step to keep their numerical advantage.

Charles Cothran is no longer at American-Marietta. Let us know where you locate, Charles. Bill Allen is now Worthy Chief of the Universal Craftsmen Council of Engineers. Don Selg, formerly at Washington Co-op. is now Chief Engineer at Darigold in Bellingham. He says he will be driving down to each meeting, as he wouldn't miss them, and also promises some new members from that area.

President Chet Bertus announced some new committee appointments: Membership, Jack Glastra; Education, Frank Gellert; Entertainment, George Kearney; Reporter to ICE AND REFRIGERATION Magazine, Floyd Burris.

Washington Chapter has an invitation from RSES and REMA to attend, as a group, the 11th Refrigeration and Air Conditioning Educational Exhibit and Conference, April 24-26, at the new Armory, Seattle.

Minnesota

GEORGE T. GARTNER

THE regular meeting of Minnesota Chapter No. 1, NAPRE, was held at Essinger's Cafe, St. Paul, with dinner at 6:30 p.m. and the regular meeting at 8:20 p.m. There were 12 members and guests present.

Richard Lingle, chief engineer of Twin Cities Milk Producer's Association, Elk River, made application for membership. Report was made on the proposed field trip through Schmidt's Brewery for May 1953. The secretary requested permission to mail the 1952 Operating Data Book to members who had not received theirs due to not attending meetings. Request was granted.

The nominating committee composed of Jonas Sundquist, Harry Brunson and Joe Walling presented a slate of officers which was elected unanimously. The new officers for 1953 are: President, George T. Gartner, Vice-President, Chester J. Belski, Secretary, Herbert M. Dupaul, Treasurer, Forrest A. Lindstrom and Sgt.-at-Arms, Jonas Sundquist.

Following the election the meeting was turned over to the Educational Chairman, Jonas Sundquist, who had prepared a detailed chart to be used for trouble shooting in Freon refrigerating systems. Considerable discussion followed before the meeting adjourned.

Yakima

ELMER A. TOOP

AT THE annual election of officers of the Yakima Chapter held on January 14, the following officers were elected for 1953: Ray M. Strait, President, Harry Dodsworth, Vice-President, Galen W. Sutton, Recording Secretary, Elmer A. Toop, Financial Secretary, and E. A. Wahlstrom, Guard. Yakima Chapter hopes to get on the ball again this year and win the membership contest.

One of our members, L. L. Anderson of Selah, Wash., thinks so much of our Guy King refrigeration course, that he has ordered extra sets for his office. We suggest he sign those other engineers up, then they won't be taking his sections when he's not looking.

New Orleans

LEO J. VIVIEN

LOUISIANA Chapter No. 2 started 1953 in a most active and pleasant manner on January 14, 1953. The chapter installed its officers at a party with their wives and sweethearts as guests. The entertainment committee made sure ample food, refreshments, music and entertainment were available. Nearly 200 members and their ladies had a grand time.

The regular order of business prevailed for half an hour. During this period President Mancuso delivered his report to the chapter, and had various officers and committeemen do likewise.

presentation of the Emerson Brandt Memorial Trophy. National Past President Addison Wegener made the presentation in behalf of President A. Clay, and explained to the gathering the work and interest necessary to obtain this trophy. The trophy was presented to President J. Chaisson. Another trophy which has been won two years running by the Chapter was presented to Membership Chairman, Damian Fischer. New Orleans Chapter is proud of the fact that it has won two consecutive legs on the membership trophy given for the most new members.

After these formalities Jerry Vieagas, M. C. of the party, brought out the entertainers. Louis Meig presented a pantomine, told jokes and sang songs; Al Bollanco soloed on a cornet and told the gathering how Harry Kelly failed his final test for a medical career and became a refrigerating engineer; Mrs. Ruth Little, wife of our good member J. T. Little, did a hill-billy gal skit replete with the proper costume and she brought the house down. A guitar and accordion player furnished the music for the acts and dancing. Jerry Vieagas and his wife, Margie, sang a duet, and can those two harmonize! General dancing and good fun continued till late, and we know the members and their ladies had a wonderful time. Al Lusch of the Reilly Benton Company was so enthused with this fine party that he donated a Fibreglas fishing rod for an attendance prize, and Bernard Murray, Chief Engineer of McCrory's was the lucky man.

The next meeting of the Chapter was held at the Roosevelt Hotel on January 28. President J. Chaisson appointed his committees and each committee was publicly instructed by the Educational Chairman, M. Olivier of the duties involved in his office. If the enthusiasm displayed by these committeemen and officers continues, the Chapter will have another fine year.

The standing committees are as follows: Educational Committee: Mario G. Olivier, Chairman, Prof A. M. Hill, J. J. Bryner, C. Keating, J. Morton and Frank L. Chase, Ex-officio; Publicity Committee: A. Lusch, Chairman, Carl Brindel, E. E. Leclere and F. X. Gillio, Ex-officio; Entertainment Committee: Jerry Viegas, Chairman, B. W. Triche, Milton Mancuso and G. E. Fairchild, Ex-officio; Building Committee: A. E. Wegener, Chairman, T. O'Connor, L. W. Howat; Membership Committee: Max Sofer, Chairman, H. C. Doss, C. Kaupp, P. E. Fielding and D. Fischer, Ex-officio; Finance Committee: Clifton Begeman, Chairman, Edwin G. Ford, John Luck and J. Prager, Ex-officio; Data Book Committee: John N. Mariakis, Sr., Chairman, E. K. Strahan, Jr., Herman O. Oertell and Vernon J. Foret, Ex-officio. The committees are under the supervision of an officer of the chapter in ex-officio capacity whose duty is to assist the committee as an advisor.

Carnival or Mardi Gras has arrived in New Orleans, so we dispensed with the February 11 meeting in order that our members could participate in the numerous activities of this very enjoyable season. Top hats and tails are the regular regalia for these boys when they appear before the royalty at the elaborate balls, climaxed with the general masking Mardi Gras Day. Wish you all were here to enjoy it with us.

Louisiana Chapter No. 2 members and their wives witness annual installation of officers January 14.

E. K. (Sol) Strahan, Sr., organizer of the chapter way back in 1923, was the installing officer with the assistance of J. Vernaci. "Sol" briefly outlined the history of the refrigeration industry from its earliest days, the NAPRE and the New Orleans Chapter. He then delivered a brief biography on each officer as he seated them. All officers were then administered the pledge of service by Bro. Strahan.

The new officers for 1953 are: President, James Chaisson; 1st Vice-President, Frank L. Chase; 2nd Vice-President, Milton Mancuso; 3rd Vice-President, Damian Fischer; Treasurer, George Whitman; Secretary, Leo J. Vivien; Financial Secretary, Eugene Orth; Sgt.-at-Arms, Joseph Vernaci; Educational Chairman, Mario Olivier; Chairman of the Board, Bartholomew Mancuso; Directors, F. X. Gillio, George Fairchild, Julius Prager, Vernon Foret, Max Sofer.

President Chaisson addressed the gathering and introduced Charles Anderson, another old timer who has attended most of the National Conventions. Charley entertained the group with happenings at some conventions he attended, generally bringing in stories of his co-conspirator and side kick, Charles Conley of Memphis. John Bigner, in behalf of the Chapter, presented the outgoing President, B. Mancuso, with a fishing box completely equipped with lures, hooks, reel and live crabs, and some small change to buy the fish he couldn't catch. He also presented Frank Chase, outgoing Educational Chairman, with a nice traveling bag so that Frank could attend the conventions in style.

A highlight of the evening was the

New Orleans Presents Emerson Brandt Memorial Trophy

Presentation of the Emerson Brandt Memorial Membership Trophy at the installation of officers of Louisiana Chapter No. 2 on January 14, 1953; left to right: Leo J. Vivien, National First-Vice-President; Addison E. Wegener, National Past President, who presented the plaque in the absence of Alvis J. Clay, National President; Jimmie Chaisson, President of the New Orleans Chapter; Jerry Vieagas; D. Fischer, third-Vice-President, New Orleans Chapter; and, George J. Whitman, National Membership Chairman.

Los Angeles

FRED HERR

MEMBERS of Los Angeles Chapter of the NAPRE journeyed to the University of California at Los Angeles on the night of February 4 to hear a talk and see a demonstration of atom smashing in the synchro-cyclotron which is housed in the university's Physics Building.

This was a repeat performance of a similar talk and demonstration given somewhat over a year ago, which had proved so popular that arrangements were made for a return visit. The speaker was Steven Plunkett, principle electronics technician in charge of operation of the cyclotron, assisted by Herbert N. Royden III, and other experts of the UCLA staff. Royden is a son of Herbert N. Royden, of the Royden Ice Company and well known member of the NAPRE.

The cyclotron was first built at Berkeley, Calif., by Dr. E. O. Lawrence in the early thirties. It was then a 37" cyclotron and has since been altered and enlarged. At Berkeley it produced particles of about 7 million electron volts and it now produces 20 million electron particles. In describing the unit, Mr. Plunkett said, "A cyclotron consists of three essential things: a large magnet, a high-power radio frequency oscillator, and a vacuum tank, in which the first two can act on a charged particle. We must understand that a charged article moves when placed in an electric field, that is, between the two pieces which are at different electric potentials. When a charged article is moving, and is in a magnetic field, it experiences a force at right angles to its motion and to the field. If the particle is unrestrained or free, its path will be in a circle, whose radius depends on the field, the velocity and the mass."

Dr. Plunkett explained that the vacuum obtained in the cyclotron is not measured in inches below atmosphere, as that figure would have little meaning. "Rather," he said, "we measure the difference between absolute zero pressure and what exists in the tank. This pressure is about one ten-thousanth of a millimeter, which is itself about one twenty-fifth of an inch. This is about four millionths of an inch or about one ten-millionth of atmospheric pressure. Special pumps are needed to reach these low pressures."

The January 21 meeting was held at the Terminal Club with 54 members and guests in attendance. The preliminary class, conducted from 7 to 8 p.m. by George Paulick, had an attendance of 22. Electric controls and control valves was Paulick's subject for the evening.

President Frank Muzzy presided over the business session. The following applications for membership were approved: Ernest H. Hess, Ken R. Gray, Herbert J. Sparling, Fern M. Draper, Henry C. Hicks and Carl O. Lindahl, and F. E. Draper for reinstatement.

Robert Savage, chairman of the educational committee, then introduced the speaker of the evening, Lewis A. Charde, assistant district chief engineer, York Corporation, Los Angeles. Mr. Charde presented an illustrated talk on "Unusual Problems in Design and Construction of Rocket Testing Altitude Chambers."

Memphis

CHARLES A. CONLEY

AT THE regular meeting on Wednesday, January 21, National President Alvis J. Clay, installed the Memphis Chapter's officers for 1953. After he had recited the preamble to the constitution, he gave the newly elected officers the oath of their offices, explaining the duties of each office. The manner in which an officer carried out the duties of his office would make for the success of the Chapter, he explained. He further urged each officer to make this year the best year of the Chapter yet in new members, better attendance at the meetings, 100 percent renewal of all old members, and more ads for the Operating Data Book.

The president of the Chapter Jack Baker, named the following as chairmen of the various committees: Doug. Smith, Entertainment, R. O. Clower, Safety, Cecil W. Sullivan, Operating Data Book, John H. Rollow, Membership, and H. W. Walling, Technical Advisor.

At the close of the meeting, President Baker invited those in attendance to join him in the grill of the Hotel Chisca, where he treated them to refreshments. While all were enjoying the refreshments, he asked his co-officers and committeemen to give him their full cooperation in doing better and bigger things for the Chapter in 1953.

It was reported that R. W. Reeds, master mechanic for the Memphis Packing Co. (branch of Armour & Co.) met with a very bad accident apparently caused by a broken sewer line caving in. His right foot went into the sewer burning his foot and leg up to the knee. Mr. Reeds is confined to the Methodist Hospital, where doctors reported it will require grafting new skin on the toes, foot and leg.

O. J. Williford, who has been a member of the Chapter for many years and a salesman for N. O. Nelson Co. has retired after being with his firm over forty years. Before going with Nelson, he was in the supply business on his own. Prior to that he was with the Lee Company for several years. Mr. Williford won't tell his years, but he's in fine fiddle —seems a shame that a man as able as he will retire. He will be missed by his many friends, for all the years they have known him.

H. L. Tood, the Chapter's instructor talked on pages 203 through 208 of the King Course. Subject was Food Preservation. Mr. Tood used the King lesson explaining the various methods of food preservations, especially the frozen foods, and including types of equipment used in the frozen food industry. He stressed the fact that all foods to be processed, especially those that are frozen should be of the best quality, tree and vine ripened, free of all bruised or bad spots.

Pittsburgh

OTTO P. KNOCH

AT A recent meeting of the Pittsburgh Chapter NAPRE, several of the officers posed for a picture, the result of which is shown below. Left to right, Alois Paulmeier second vice-president, James B. Reiter, first vice-president, Alfred Lossing, sergeant- at-arms, and seated Louis P. Mantz, president.

Officers of Pittsburgh Chapter

President Louis P. Mantz is chief engineer for Wainwright Cold Storage Company, Pittsburgh. He is a past president of NAPRE, having held the highest National office in 1936. He has also held positions in the local chapter. Mr. Mantz received his apprenticeship and engineering training in the refrigeration industry with several Pittsburgh breweries and went with his present firm in 1920. He has been a member of NAPRE since.

The Educational Chairman, Alfred W. Lossing, is chief engineer for Pittsburgh Brewing Company. He has been a marine engineer, boiler inspector and Lt. Commander in the U. S. Navy during World War II. He is a member of National Association of Power Engineers, and as chapter instructor he is giving us the benefit of his experiences and his educational training at the University of Detroit.

Tacoma

ELMER JOHNSON

AT the regular meeting of Tacoma Chapter, NAPRE, held on January 7, the following new officers were elected to serve the chapter in 1953. John Moyer, President; Clarence Mase, Vice-President; C. W. E. Johnson, Secy.-Treas.; Joseph Zini, Sgt.-at-Arms; Philip Gilmore, Chairman, Educational Committee; Wayne Vanderflute and Lee Hasse, Membership Committee and Charles Steiner, Chairman of Social Committee.

The chapter selected Phil Gilmore, Chief Engineer of the Pacific Refrigerating Co., as chairman of the Educational Committee to replace Al Slater who had to decline because his business quite frequently kept him from the meetings. The chapter expresses appreciation of Al's interest and assistance in the past.

NAPRE Department

San Francisco

LEWIS BROOKS

AT the January 14 meeting of California Chapter No. 1, a chapter past-president, Marshall T. J. Garlinger, installed the 1953 officers. They are president, Herschel O. May, Industrial Installations, Inc.; first vice president, Frank Cardoza, Golden State Company, Ltd.; second vice-president, H. E. Boudreau, Cyclops Iron Works; secretary, Lewis Brooks, Carrier Corp.; treasurer Charles Stewart, Golden State Company, Ltd.; sergeant-at-arms, Fred L. Imsand, Spreckles-Russel Dairy Company; instructor, Don Byrant, Professor of Mechanical Engineering, San Francisco City College; and Directors Walter W. Sandholt, York Corp., Marshall Garlinger, Military Sea Transportation Service and Bill Orton, Nels Rosberg, Inc.

HERSCHEL O. MAY
Berkeley

M. T. J. GARLINGER
San Francisco

Herschel May, the new president has only been a member of NAPRE since 1948 but has been twice as active to make up for his junior years. Born in the State of Washington, Hersch attended the University of Oregon, sailed the U. S. Merchant Marine, did a hitch in the U. S. Marines and wound up his education at Healds Engineering College, San Francisco. A member of ASRE, he is president and general manager of Industrial Installations, Inc., Berkeley.

News reaching this meeting indicated that Chapter Past President, Wilbur Roberts, has been in the Marine Hospital for several weeks but is recovering rapidly. Wilbur is the chief engineer of the much publicized cold storage plant of the Market Center, Quartermaster Corps, U. S. A., at Alameda.

Rio Grande Valley

C. R. BURG

MEETINGS of the Rio Grande Valley Chapter, NAPRE, since the holidays have been rather infrequent. However, we look forward to regular meetings again starting with February and hope to have our reports in by the ICE AND REFRIGERATION deadline.

Contributions by members of this chapter to the Emerson Brandt Memorial Membership Trophy are now in and have been forwarded to national headquarters. Rio Grande Valley is proud to have participated in this activity.

Detroit

LEON ADAMS

REGULAR meeting of Michigan Chapter No. 1, was held at Carl's Hall on Thursday, January 15. The educational session was conducted by Boyd Kitts and the opening topic was refrigeration compressors.

This turned out to be a most interesting discussion. The discussion and blackboard illustrations covered a range from the largest down to the smallest commercial machines. There was considerable comment on shaft seals, and, lo and behold, if we didn't find an authority on the subject sitting right in our midst in the person of William Jeffrey. He was called upon for blackboard sketches or illustrations, and a talk on their function and operation.

We found that Mr. Jeffrey operates a repair shop where seals are his specialty, and he was able to cover all the various popular makes. There was one question, however, which was not fully disposed of. That was packing on the large machines: what is metallic packing actually made of? What are the actual materials in the other packings between? And, when should oil be used on packings, how much, and what kind of oil? Unfortunately, none of our associates who represent the packing companies were present at this meeting, but we hope to get them at some meeting for the answers.

The new officers of Michigan Chapter are: President, Roy T. Burns; First vice-president, Charles M. Heemstra; second vice-president, Arthur A. Craddick; Secy.-Treas., L. L. Adams; and, Sgt.-at-Arms, Melvin A. Larsen. The Board of Directors is headed by Boyd Kitts, chairman, and composed of Leo C. Gage, Wm. Appleton, George M. Baird and Charles R. Chandler.

The committees appointed are as follows: Educational: Robert C. Doremus, chairman, Boyd Kitts, Leo C. Gage, J. K. Rawsthorne, and Charles M. Heemstra; Membership: Arthur A. Craddick, chairman, William G. Euth, William Gordon, Chas. J. Purdie, Jr., Erskine L. Sheffer, Charles W. Cornwall, William T. Heaney and William Jeffrey; Program, Social and Entertainment: William Appleton, chairman, Norman E. Garant, Richard A. Kiefer, Ernst Schukraft, John L. Caren, Edward F. Greh, George M. Baird, Walter Arndt, Norman F. Danaher and Fred Karn; Sick committee: Leo C. Gage, Arthur O. Smith and Albert Chesbrough.

Dallas

CECIL E. TAYLOR

AT the regular meeting of Dallas Chapter, NAPRE, held on January 5, 1953, in the Auditoium of Alford's Refrigerated Warehouse, one of the chapter's members, L. P. Reiss, consulting engineer, lectured on the duties of an operator. Peter J. McCarty, sales engineer of Sporlan Valve Co., spoke about the types and uses of valves in refrigeration.

On January 19, at the same location, the meeting had another member speaker. Obert K. Irvine, of the Southland Corporation, conducted a discussion of Questions on Operating (Chap. XIV, Sec. 8, NAPRE Refrigeration Course).

P. S. Paul, of Allis-Chalmers Mfg. Co. was the chapter's guest. He showed some movies about centrifugal pumps, and their maintenance. It was noted that the maintenance schedule published in the January issue of ICE AND REFRIGERATION, under Question 942, Question Box, concurred with the recommendations of the Allis-Chalmers Mfg. Co.

Membership-at-Large

LEO J. VIVIEN

RECENT remittance from Leslie E. Steggel, of Newberry Gardens, Upminster, Essex, England, carried a note that he would like to wish all members a Happy and Prosperous New Year. Further, Mr. Steggel thanks the Chapter Reporters for the enjoyment he has received in reading the monthly reports. His closing comments were on the benefits he has felt in digesting the helpful refrigeration course.

Meet Your Officers

FIRST Vice-President of NAPRE for 1953 is Leo J. Vivien, Executive Secretary and Examiner for the City of New Orleans License Examining Board. Leo has held every position in his Chapter, Louisiana No. 2. The first vice-president started his engineering career, after two years of special college engineering training, with Gardener's & Shipper's Ice Company in New Orleans. Prior to appointment in the Licensing Board he had been chief engineer of Republic Ice Manufacturing Company for eight years.

Leo J. Vivien

A member of the Engineers and Architects Club of New Orleans, Mr. Vivien holds a state registered professional engineer's license as well as a first class operator's license in steam, internal combustion engines and refrigeration.

His duties as first vice-president keep him in contact with the membership-at-large. According to the NAPRE

manual of duties for officers, its Leo's job to keep up the interest of this membership division and to represent them before the Board of Governors. With some 250 members in this class, Leo's corresponding time is well absorbed.

Regis Gubser

THE second vice-president of NAPRE for this term is Regis Gubser, Chief Engineer of California Consumer Corporation at Los Angeles. A graduate of California Institute of Technology, with a Bachelor of Science in Electrical Engineering, Regis has been a consistent contributor to ICE AND REFRIGERATION and the Operating Data Book, as well as a technical speaker at many NAPRE conventions. A member of NAPRE since 1932 he has held many offices in California Chapter No. 2 and was section chairman of ASRE at Los Angeles in 1940.

His duties as the second vice-president are connected with chapter activities. Regis is the representative of the chapters in the Board of Directors and also the doctor when the chapters are ailing. When chapters overlook their monthly reports to ICE AND REFRIGERATION, Regis is the stern schoolmaster who checks up on the homework.

Changes in San Francisco

REFRIGERATION circles in San Francisco have undergone quite a few changes in the past few months. E. C. Cooley Company of that city announces that Ed. Flynn, formerly business manager for the Refrigeration Contractor's Association of Northern California, has now become associated with their firm. Ray Gruss has been elected president of the RCA of Northern California, succeeding the late Ed. Tanner, who died October 18 of a heart attack. The Ed. Tanner Refrigeration Works is now managed by George Witcosky and the sales department is managed by Ralph Wetzel. The Tanner Works retains the Frick Company agency.

N A P R E

Question Box

H. G. Venemann, Professor of Refrigeration, Purdue University and chairman of NAPRE Educational Committee, answers members operating probems monthly in this column. Send questions to Chairman H. G. Venemann c/o Purdue University, West Lafayette, Indiana.

Further Questions on Crossfield's Solution for Heaving Floor

THE January issue of ICE AND REFRIGERATION (page 50) carried a practical solution for heaving floors by the Crossfield Ice Co., of Griffin, Ga. Shortly after the publication of this article the following questions were sent in from one of our Canadian friends.

(a) Where did the heat come from to remove the frost condition beyond the width of the tunnel?

(b) What prevents the tunnel from freezing?

(c) What was the condition of the insulation?

(d) Was the floor structure the limiting factor which necessitated stripping the floor above?

(e) What temperature was obtained in the tunnel during and following the excavation period?

(f) What is your recommendation for the best method of installing a freezer on earth above or below grade? The Beare Ice and Coal Company installation is summarized so briefly that its merits cannot be determined with respect to design, cost or practicability. (See page 11, January, 1953, ICE AND REFRIGERATION.

Mr. Crossfield very kindly answered the first five of these questions as follows (The sixth question was referred to the author of the Beare article):

(a) The heat to remove the frost condition beyond the width of the tunnel came from the atmosphere. We made the outlet at one end of the tunnel higher than the other thereby creating a draft through the chimney effect due to the difference of elevation.

(b) Our tunnel does not freeze because in our location the air temperature does not stay below freezing long enough to freeze it. I would imagine that in your location you would get best results by leaving your tunnel open in the summer and closing it in the winter. I should think you would warm the ground

enough during that period to carry it over the winter. If you did find a tendency to refreeze, you could still close it in the winter and put a small heater in the tunnel. In our climate we close our tunnel in the hottest part of the summer in order to save on refrigeration.

(c) We could not see our insulation since it was in between two concrete slabs, but since the slabs were cracked I would assume the insulation was also cracked. We have not had any difficulty with these cracks however.

(d) We stripped the floor to prevent thawing of long term storage placed over the tunnel which was carrying warm summer air. These strips permitted the zero storage air to pass between the merchandise and the floor.

(e) We did not take the tunnel air temperature. However, I would estimate that with an outside air temperature of between 85 and 90 we had a tunnel temperature during the digging process of about 60 and about 70 to 75 after the tunnel was completed. All temperatures in deg. F.

Pressure Drops, NH_3 Valves

Question No. 946: Do ammonia shutoff valves have pressure drops similar to other globe valves? For example, the familiar Crane Company fitting chart shows a wide open 3 inch globe valve having a resistance to flow equivalent to 80 feet of 3 inch pipe. Does this hold for a wide open ammonia valve?—G. E. G.

ANSWER: Crane Co's. Technical Paper No. 409, May 1942, gives a value of 83 as the equivalent length of 3 inch pipe for a 3 inch ammonia globe valve (open). I find that this represents a pressure drop of 0.12 psi per 100 foot of pipe when carrying 25.5 lbs. of ammonia gas per min. at 185 psig. This would be the amount required for 59 tons refrigeration capacity.—H. G. Venemann.

Water Tank Anti-Freeze

Question No. 947: How much salt would have to be put in a 70,000 gallon water tank to keep it from rupture by freezing? Or better, let me give you the problem where we have an elevated steel tank to be taken out of service for two or three years. How can it be protected during that time?—G. E. G.

ANSWER: I do not think it advisable to put salt in your tank to prevent it from rupture by freezing. Since you are taking it out of service

for two or three years why not drain it, and give it a good coat of paint? There are several paints that could be used to protect it from undue corrosion and still not contaminate the water when put back into service.

I would hesitate to use a salt brine, not only because of the cost, but because the steel would no doubt corrode badly at the brine level.—H. G. Venemann.

Liquid Run-Back on Booster Discharge

Question No. 948: In our two stage ammonia system, we find that after a shut down of say 4 to 8 hours, that ammonia gas condenses in the discharge line leading to the condensers, runs back down the line to the discharge valve on the second stage compressor, causing liquid ammonia to drop down into the compressor when starting up. We have an unusual condition in that the discharge line to the condensers is extremely long. How can this be corrected?—James R. Bennett, Wash. Chap. No. 1.

ANSWER: It is usual for some condensation to take place in the discharge line between the high pressure cylinder and the condenser after the compressor has been shut down. The oil separator usually collects this surplus liquid and prevents it from doing harm to the compressor. Of course the oil separator cannot collect the small amount of condensate which is in the riser between the compressor and the separator.

Your trouble will be corrected by properly draining your discharge line. The riser from compressor to separator should be relatively short so that the weight of condensate in it will be as small as possible. The horizontal line between compressor and oil separator should drain toward the separator. Beyond the separator all condensation will have to be collected in the separator except that portion which can be drained toward the condenser. If, as you say, your discharge line is extremely long it will hold considerable condensate. Evidently this is draining back toward the compressor. It should be collected in the oil trap unless the trap is too small, or unless the trap is too far away from the compressor.

If you do not want to relocate the oil separator as suggested above, you may get rid of this excess liquid in several ways: First, pump out discharge line with stand-by compressor before starting two stage compressor; second, tap discharge line near compressor and expand liquid into a low pressure region; third, if liquid receiver is below compressor discharge, tap line and blow liquid into receiver.

Perhaps we can get some good ideas from the membership. If any members have a good practical solution please send it in. We appreciate help from the field.—H. G. Venemann.

New Questions

NH_3 Emergency Disposal

QUESTION No. 949: At the opening of the Korean conflict, our government set up a Civilian Defense Agency to augment the defensive forces, and to render services of aid and assistance to the civilian population should this nation be attacked. San Francisco Chapter, NAPRE, invited the CDA authorities in that city to address the Chapter and to advise how their group might assist in local civilian defense. One problem presented by the members in San Francisco, and which, to best of the writer's knowledge, has not been solved to date, is the disposal of tons of liquid NH3 in the event of a catastrophe. Actual experience of several San Francisco engineers in dumping even small quantities of NH3, in an emergency, in semi-residential areas, routed not only personnel in plants but also from apartment houses and residences. What are the experiences of other NAPRE members? Any recommendation?—B. C. McK.

Insulation of Thermocouple Leads

QUESTION No. 950: Is there any type of conductor available in which the insulation will not deteriorate when subjected to condensation within the conduit? For example: Readings from Thermo-couples in cold storage rooms of my plant have gradually grown inaccurate. Investigation by manufacturer's representative indicates condensation in the conduit caused the insulation to break down resulting in improper readings. Renewing the leads with the same #24 guage twin conductors and sealing ends of the conduit with hydroseal is all the manufacturer had to offer.—C.J.F.

Power Requirements, Various Refrigerants

QUESTION No. 951: Does it take more power to compress one refrigerant than another?—L.J.V.

Committees Appointed

THE president of NAPRE, Alvis J. Clay, was busy during January appointing members to the various national committees and outlining projects for these committees. He announced the appointment of Robert Doremus, Detroit; L. V. Fleiter, St. Louis; A. M. Hill, New Orleans; Elmer Johnson, Los Angeles; Guy R. King, Santa Monica and L. P. Reiss, Dallas, as members of the national educational committee. This committee is headed by Professor H. G. Venemann.

Appointment to the membership committee were George J. Whitman, Chairman, New Orleans; Warren Cunningham, Dallas; Arthur Thomas, St. Louis; M. E. Bell, Seattle; J. D. Sims, Dallas; Ray Burnett, Los Angeles and S. M. Rambo, Lancaster.

President Clay announced also the appointment of a sepcial committee to be known as the Chapter Activities Committee, which will be headed by the Second Vice-President, Regis Gubser of Los Angeles. This committee is composed of Eugene Rytlewski, Chicago; Frank X. Gillio, New Orleans; Ken. Holaday, St. Louis; H. G. Turner, Tulsa; Floyd Burris, Seattle; and, Mark Campbell, Fresno. The committee is charged primarily with originating ideas for chapter activities and with planning coordination of educational, membership and social activities within the chapters. Their function is to aid chapters in promoting interesting programs for their annual calendar.

Erich Utescher was again appointed chairman of the Operating Data Book Committee and S. A. Cole, a former director, was appointed chairman of the Publicity Relations Committee.

William J. Sullivan

REPLY to a dues invoice brought sad news that William J. Sullivan, an active member-at-large of N.A.P.R.E. since June 12, 1931, had passed away October 17, 1952. The late member was born in 1870 in Springfield, Mass., and went to Spokane in 1898. In 1910 he was appointed to the Spokane Park Board on which he served for five years. He had been employed for 21 years by the Carsten Packing Company and also for a number of years each by L. M. Davenport and Ryan-Newton Company.

Mr. Sullivan had been preceded in death by his wife. His last will, after providing certain cash bequests to relatives and friends, leaves the residue of his estate to the St. Joseph's Children's Home at Spokane, Wash.

THE ICE INDUSTRY

NATIONAL ASSOCIATION OF ICE INDUSTRIES

Executive Offices
1706 L St. N.W., Washington 6, D.C.

Executive Secretary
Guy W. Jacobs, Washington, D.C.

President
Wm. J. Ayers, Memphis, Tenn.

First Vice-president
Paul H. Andres, Oklahoma City, Okla.

Second Vice-president
E. L. Gunn Jr., Atlanta, Ga.

Treasurer
Geo. Steers, Jr., Kalamazoo, Mich.

THIS MONTH IN BRIEF

A review of the accomplishments of the research program and its practical value to ice men is presented by C. P. Austin, director of research for the National Association of Ice Industries. The future of this program, he says, will take two forms, an expansion of research, and making fuller use of what is already known.

Effective use of the new ice channel produce display method is being studied in a research project initiated at Purdue University. This method shows promise of providing an innovation in ways of displaying fresh vegetables with crushed ice.

A new chilling method known as vacuum cooling has been developed in California for shipping fresh vegetables, chiefly lettuce.

Ice has an attractive attention value in restaurants and hotels and at parties where it can be used in the form of ice carvings.

Reports from ice associations show the annual ice convention season in full swing. Some have already been held and others are still in the planning stage.

More Profit Through Research

C. P. AUSTIN
Director of Research
National Association of Ice Industries

Industrial Research quite often produces usable and profitable techniques, the source of which may be overlooked or not known by many members of the industry. This report by Mr. Austin, telling again of the work of the Research Department of the Ice Industry, will bring all ice men up to date on what has been accomplished and on current projects that are now under way.

THE research program of the National Association of Ice Industries is directly related to the profits of the Industry, the profits of this year, the profits of next year, and the profits of all the years to come. Research has a vigorous and recurring role in creating new and profitable markets for Ice. It has a vital and continuing part in adapting our products to these outlets. It has a prominent and constant place in developing equipment, facilities and methods with which to manufacture Ice more efficiently and with which to serve our customers more effectively.

The entire research program is a going business. It's a continuing activity. Each year projects are finished, and the results are passed along to you. Other projects are in progress. Others are just being started. And still others are being planned for the future. At present you are enjoying the profits from work which has been completed. Studies which are now underway, and investigations which are in the planning stage we hope will make good reading and listening for you as these findings can be made available. All of this work, regardless of the stage, can have and will have a definite and direct bearing on profits in the years ahead.

During the past seven years, since World War II, the Research Department has conducted work in many fields, and it has participated in many projects from which the Industry is now profiting. I can't review all of them, but let's look at a few.

Completed Projects

The first was the investigation to determine and prove the value and soundness of icing vegetable displays in retail stores. Projects in a number of the country's leading colleges and universities provided the facts. Emphasis was placed on displaying and selling produce rather than keeping it. Equipment for display and plans for converting cases were developed. The work made it possible to extend the use of Ice in food stores.

Studies at Michigan State College and the University of Massachusetts opened the way to extend hydro-cooling and package icing, to extend these methods to regions where they had not been used, and to commodities for which they had not been considered of value. A new use for Ice was discovered in the marketing of peaches. A place for Ice has been created in the marketing of locally grown and locally consumed vegetables.

This research did more. It always does. It stimulated others to study our product and to experiment with it. It promoted others to explore the value of hydro-cooling in commercial growing areas where it had never been used. It encouraged others to investigate the merits of hydro-cooling for commodities for which it had never been employed. Hydro-cooling can be expanded with some effort; it is destined to grow. The latest outside boost is a study which has just been completed by Cornell University. It credits hydro-cooling of apples with increasing their storage life up to sixty days.

Our work at the University of Massachusetts opened to us the need for and value of Ice in the handling of fresh vegetables. Although much work still needs to be done on other products, we have followed through in the icing of sweet corn for local markets. As a result of studies in Ohio, Indiana, and Illinois we came up with the wet strength paper bag for icing sweet corn.

This program attracted national attention of growers, chains including A & P and Kroger, and the Department of Agriculture people. The Union Bag and Paper Corporation tells us they sold 315,000 corn bags during the first season. That represents almost 4,000 tons of Ice for the bags of this one company. Other companies sold bags for this purpose. Some corn was iced in wet strength bags ordinarily used for Ice deliveries. The publicity which the trade gave the program caused many to Ice corn in crates. It stimulated interest in icing corn generally.

We are not talking about rail and truck shipments which have moved from the commercial growing areas of the South and West to Mid-western and Eastern markets and which have been iced in the past. We are convinced, however, that the local program has prompted many truck operators to do a better job of protecting their loads with ice. In Ohio alone, more than 2,000 acres of local corn were iced. This created 4,000 tons of new business the first year.

Poultry Icing

We have conducted work in poultry icing. We have cooperated with poultry packers and the Poultry and Egg National Board in bringing about more wide-spread adoption of the retail iced display.

Several months ago I was asked to appear on the program of the Poultry and Egg National Board in Chicago. I was greatly impressed by what I saw and what I heard. The poultry industry is going strong. They have a great program and they are achieving results. The old "blood and guts" days of finishing up the dressing of poultry before the customer will soon be a thing of the past. The aim is to get all poultry dressed in modern processing plants. The aim is to get away from New York dressed birds altogether and toward eviscerated or cut-up poultry. The aim is toward improved methods of processing, improved methods of handling and shipping and improved methods of display. In all of this, Ice plays a vital part.

Ice has gone into poultry cases for years, but it never gained the prominence warranted by its effectiveness and attractiveness. During the past year or so many Icemen have profited by this entire program.

The development of vending stations, different uses for ice, meat on ice, improved handling methods for vegetables, producing of prepared ice, ion exchange, are a few of the projects in which research has taken a prominent part. Profitable future use of this program will take two forms: one is an expansion of research, the other is to make fuller use of what is already known.

There is little that I can add to what has already been said about one of our most spectacular and profitable projects — the use of Ice in mechanically refrigerated meat display cases. This was first reported to you a year ago in Houston. During the summer, the final report was released by Dr. Carroll of the University of California, who conducted the work. This research work provided the facts so that we could again go back into the country's meat markets, so that we would have a sound and profitable service for the meat dealer. It provided the data for a good down-to-earth sales approach. It opened up year round profitable new Ice business.

Vending Stations

At the end of World War II there were only a relatively small number of Ice vending stations in use in the country. Most of these were cencentrated on the West Coast where they were being manufactured.

Our Committee recognized what efficient use of this method of merchandising could mean to the Industry. It worked diligently to get the units adapted to the Industry's needs. It set out to get them distributed on a more favorable basis to Ice manufacturers in other parts of the country. It cooperated with the original manufacturers in adjusting their distribution to the Industry's need. It assisted two would-be manufacturers in designing satisfactory units. These manufacturers have since become important and convenient sources of supply of this equipment for many companies.

The Research Department and three leading manufacturers of vending machines jointly sponsored work at the Wharton School, University of Pennsylvania, to develop information on the proper locations for vending outlets. This material has been extensively used by the salesmen of these companies and by Icemen generally in evaluating site for stations. As a result, Ice vending has become an important and useful method of marketing Ice.

Maybe you've forgotten, but the Research Department worked with the bag companies in developing the wet strength paper Ice bag which has been generally accepted for packaging and delivery of prepared Ice.

The Department had a hand in improving the design of delivery truck bodies. It has made comparisons of competitors' methods of display and Ice methods. It has tested point-of-use Ice machines. It has studied their efficiency, and their weaknesses.

We have worked with manufacturers and others to get equipment designs improved, to get items built, to get our finding in the hands of people who would help promote the interests of the Iceman.

Current Projects

Our Committee has become interested in channel icing. You may have heard it discussed here or read of it. In the retail display, instead of the Ice bed under the vegetables, perforated metal dividers which hold the Ice are placed between the commodities. The vegetables are displayed on a rack to permit the cold air from the channels to circulate under the products. The people who make the dividers claim that the cold flows sideways through and under the vegetables, that effective temperatures are maintained, and that less labor is required.

We have been asked to plug this method of display. Our committee concluded that it was only good sense to be sure just what we have before we abandon present methods for a new idea. We are now negotiating with Purdue University to run a test on Ice channels to find out how efficient the method is and how it compares with the Ice bed. Comparison of channel icing and mechanically refrigerated units also will be made.

Success of the use of Ice in meat cases has stimulated our enthusiasm to try to develop a sound basis for

using Ice in mechanically refrigerated vegetable display cases. The use of channels in these cases with a limited amount of garnishing might be the answer. At any rate, in the channel study, we also plan to study methods of using Ice in mechanically refrigerated cases. If we could come up with a sound and economical method of extending our service to these units it would open a profitable new market.

Wrapping Perishables

The wrapping of all perishables in films has not moved as rapidly as many of the early enthusiasts predicted. Films of one type or another, however, are continuing to grow in popularity in the display and sale of perishables. In general, moisture-proof films have not been favorable to the full values of our product. This entire subject often has been the topic of discussion at our Research Committee meetings. We, of course, could be content to limit our scope to unwrapped perishables. On the other hand, some of the problems of so-called moisture-proof films are being removed. In fact, we have some proof that we may have possibilities even with these films. At least one manufacturer is advertising and promoting a film for poultry for iced display. A conference at the research laboratory of this company has provided additional encouragement. This year we are seriously considering undertaking some work in this field. Prepackaging of meats has had its troubles. It is entirely possible that through proper study we may be able to carve for ourselves a profitable place for Ice in the handling of packaged items.

Last year we sponsored a study at Purdue to determine whether or not improved handling methods between the field and the cannery would improve the quality of canned lima beans. The results prompted expansion of the study to include asparagus, green beans, and peas for canning, and sweet corn for freezing. The work is under way. We should have a more complete report in the spring. If we can establish the fact that icing from the field to the canning plant raises the grade of the canned product the method should have economic appeal to the canner.

The second year's work on hydrocooling of peaches at Michigan State College was completed a year ago. The report was published by the experiment station and is now available.

Factors beyond our control have delayed the publication of the report on the vegetable icing work which was done at the University of Massachusetts three years ago. This study dealt with the icing of local products for local markets. The commodities included were: carrots, celery, lettuce, spinach and sweet corn. Although the report was delayed, we were permitted to make generous use of the findings during the delay. We hope now to have this report by the end of the year.

Processed Ice Machines

Certainly one problem with which we are plagued is the mounting cost of processing Ice on one hand and the keenness of competition on the other. For a year and a half we have been trying to interest some competent manufacturer in developing and building a machine specifically suited to Ice plant use which would produce prepared Ice automatically. At first our efforts were unproductive. Later, two or three manufacturers became sufficiently interested to tackle the problem. The past year has provided additional encouragement in this field. A machine has been designed which looks promising and an established company has undertaken the job of developing and building it. It freezes clear, solid cubes. It makes use of brine from the tank as a refrigerant. It operates automatically. It is to be designed so that multiple units may be employed. A small model has been made. Next, a unit is to be built for a trial run in an Ice plant. Plans call for putting the unit on the market as soon as it is perfected. If this development is successful it should provide a means of improving our competitive position with point-of-use Ice makers.

Ion Exchange Study

The two-year study of ion exchange for treatment of water at the University of Texas is in its second year. Real progress can be reported. In another year we hope to be able to have some factual data of what ion exchange can and cannot do for you. We hope to have information of an economic and performance nature which will furnish guidance in the purchase of this equipment. Emerson Brandt's passing delayed completion of the water treatment manual which was being prepared for operating engineers. Plans are under way, however, to work out some arrangement with K. M. Holaday to get the study completed.

In closing, I should like to add this comment. As I look back over the program, I am convinced that we have made progress. I am sure that the Industry has certainly received its money's worth, together with generous returns on its investment. As we look ahead however, there are two ways to make more profitable use of the program. One is to expand it. The other is to make fuller use of the findings.

The Ice Industry

National Ice Trade Advertising

FORTY advertisements in trade publications issued from February through September make up the remainder of 1953 national ice advertising to commercial customers, says a recent release by the publicity department of the National Association of Ice Industries.

The insertion schedule includes the following Retail Market Publications with total combined circulation of 1,070,916: Chain Store Age, Food Topics, Meat-Fresh & Frozen Food Merchandising, National Grocers' Bulletin, Progressive Grocer, Super Market Merchandising, Voluntary & Cooperative Groups Magazine.

The following beverage publications with total combined circulation of 543,666: American Restaurant, Bar & Food, Chain Store Age, Fountain & Fast Food, Hotel Management, Hotel Monthly, International Steward, Restaurant Management.

The following fruit and vegetable publications with total combined circulation of 678,081; American Fruit Grower, Market Growers Journal, Packer.

Ice Goes to Local Shows

THE Detroit City Ice and Fuel Company made good use of its booth space at the first annual Detroit Food Festival, held recently. Collaborating on the display with a produce supplier, a meat distributing firm, and two refrigeration equipment dealers, the ice company featured meat and vegetables on ice, a picnic chest, and produce case "channels" in its booth. Iceman D. J. Martin reports a successful show.

The People's Ice Company, Syracuse, N. Y., supplied crushed ice for the Ready-to-Cook poultry exhibit at the annual exposition of the Northeastern Poultry Producers Conference. Over 5,500 people attended and ice literature at the booth was a sell-out. The interest shown was outstanding, says P. J. Martin, treasurer of Peoples Ice.

The Ice Industry

Truckers Offer Market For Crushed Ice Service

TRUCK transport of perishables is growing. Gleaned from the Convention proceedings, the National Association of Ice Industries, outlines efforts icemen are now using to lure the truck trade to their plants:

1. If the plant itself can't accommodate trucks, install a storage house and slinger unit at a "truck stop" where the drivers pull in for fuel, meals and lodging. Station attendants can handle the icing.

2. Print cards for the truckers giving ice plant location and type of service available. Include street map showing how to reach plant from highways. Ask a few regular-customer drivers to hand out cards at truck centers.

3. Keep a record of truck buying ice at plant throughout the year. At beginning of new year, send each a mailing piece reminding them of plant facilities. Two separate pieces can be made up—one for small operators, another for fleet owners.

4. Set up bunk facilities for truckers at the plant. Invite drivers to rest while truck is being iced, longer if desired. Also, serve free hot coffee and sandwiches.

5. Post luminous signs at intervals along the main highway, starting 50 to 60 miles from the plant, advertising the icing facilities.

One multi-plant company circulates questionnaires to both the distributors of perishables and the truckers in its area. Data is collected on commodities shipped, type of icing service these operators want. Special maps of the state are also handed out indicating sites of all truck icing stations and service is available.

City Products Names Twomey Manager Cincinnati Division

PROMOTION of J. M. Twomey to be manager of the Cincinnati Division of City Products Corp. effective February 1, has been announced by Wm. J. Sinek, President. Sinek announced that H. F. Adams and E. L. Urban would retire from active management of the division on that date. Mr. Twomey has been associated with City Products for many years and recently has been controller. M. G. Brady will be assistant controller. Paul V. Brogan has been given broadened duties of trucking superintendent in addition to division superintendent of the company.

New Vacuum Precooling Plant for Lettuce

A NEW $250,000 vacuum precooling plant for lettuce will be erected in the Salt River Valley by the Crystal Ice and Cold Storage Co., Phoenix, Ariz. Wilbur F. Asbury, Crystal's president, said the new plant will be the same size as the one put in operation last November.

The vacuum precooling process cools the lettuce to a temperature of approximately 32 F, making it possible to ship without top icing.

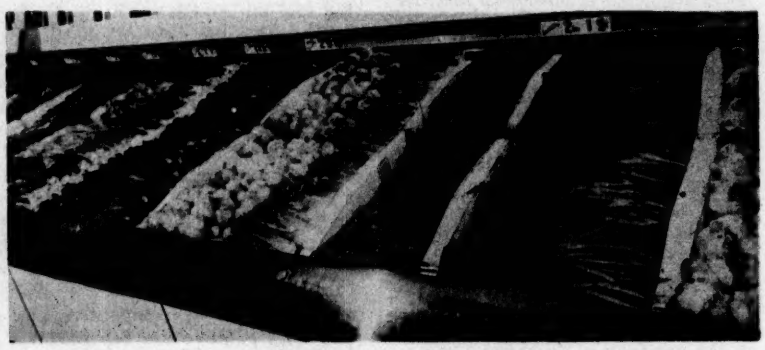
Indiana Landmark Burned

A LANDMARK of Crawfordsville, Ind., the building formerly occupied by the Crawfordsville Ice and Cold Storage Company, burned to the ground recently with a loss expected to exceed $150,000. It was built around 1880 by Will Martin, father of the late Wm. K. Martin, who operated the plant for more than half a century until his death in 1949. The building was owned by Howard B. Cook who purchased it in 1950 from The Indiana Ice & Fuel Co. of Indianapolis.

Research Project to Study Ice Channel Produce Display Method

EFFECTIVENESS of the new "ice channel" produce display method as compared with that of conventional ice bed display is being studied in a research project recently initiated at Purdue University. The project is sponsored by the National Association of Ice Industries.

Primary object of the experiment is to determine whether, as it is claimed, the channels retain freshness and moisture content in produce as efficiently as an ice bed. The weight changes due to moisture loss or gain as well as salable weight loss resulting from trimming.



A set of wire channels used to separate vegetables in iced display counters.

Four six-foot ice display cases are being used in the tests. Identical displays of vegetables are set up in all four cases for each test run. Produce is placed on an ice bed in two of the cases and refrigerated with the ice-holding wire channels in the other cases. Commodities employed are lettuce, celery, carrots and others which together represent the great bulk of retail sales. The selection is also made up to represent all types of produce in physical characteristics.

Produce in each case is checked at intervals throughout the test run for weight, freshness, and general salability. Displays are maintained in strict accordance with recommended practices to draw maximum benefit from the refrigeration. Trimming of vegetables takes place when necessary. Records being kept will show latter refrigerates by direct contact with the vegetables; using less ice, the channels provide chilling via sideways flow of the cool, moist air through the display.

Conducting the study are personnel of the Purdue Agricultural Extension Service and the University's Department of Horticulture.

Completion of the current tests is expected to take three or four months. The National Association of Ice Industries will conduct another project at Purdue during the coming growing season on icing of produce prior to canning. In these tests, peas, asparagus, lima beans and green beans will be chilled with ice between field and cannery with the aim of improving their grade. Sweet corn for freezing will also be included in these experiments.

Safety for Ice Plants

THE following message, addressed to all ice plant owners, appeared in a recent issue of the National Safety Council News Letter. It was signed by Sloan Childers, Safety Engineer, Southwest Ice & Dairy Products Co.

The rate you pay for workmen's compensation insurance is based upon the benefits of the Compensation Act of your state, plus the loss experience of the ice industry in the state and the record of the ice industry in all states.

Insurance companies turn in all accident cost records to a statistical bureau which apportions premiums received against losses in each industry. When the losses run above the permissible percentage, the base rates are increased by the bureau and the entire industry is compelled to pay an increased rate. The manual experience rates for an industry are based solely upon the accident experience of the whole industry. However, an individual risk is experience rated by either credit or debit from the base rate, depending upon whether the individual record is good or bad. Each ice manufacturer then makes his own rate, depending upon the losses and expense paid to service the particular risk.

If the ice industry as a whole has a good experience for five years, you may expect to profit individually by a very favorable base rate. Conversely, if the ice industry's bad accident experience is permitted to progress unchecked, the result can only be an ever-increasing rate for workmen's compensation insurance.

According to statistics gathered by the National Safety Council, and other reliable agencies, the ice industry's average frequency rate is 51.09 lost time accidents for each million manhours of work. Only two other industrial activities in the United States have more accidents than our industry. Our severity rate is 3.31 days lost for every thousand hours worked. Only four other industries have more severe accidents. The average frequency rate of all industries is 14.16. Average severity rate is 1.28.

On the basis of these figures, it is estimated that industrial accidents in the ice industry cost the ice operators of America in excess of eighteen million dollars each year, and it has been costing that much for many, many years.

Each ice plant owner, no matter how large or small his operations, can make a start on reducing this enormous expense by becoming a member of the National Safety Council. It is a non-profit organization and very inexpensive to the members. The Council will furnish advice, literature, posters, pictures, booklets and all material for a sound safety program. The savings of just one small accident in your plant will pay for a full year's dues in the Council.

Vacuum Cooling New Method of Shipping Vegetables and Fruits

A NEW chilling method known as vacuum cooling has been developed in California for shipping vegetables and fruits which, it is claimed, greatly reduces the need for ice packing. The vegetables are processed in cooling plants where they are put in vacuum cylinders which reduce their temperature to near-freezing. After removal from the cylinders, the vegetables retain a low temperature with only standard rail-car refrigeration on the trip to market. That involves the use of ice in bunkers at the ends of the car—but not on the vegetables.

Paper Cartons Used

Another change is in packaging. Traditionally, most fresh fruits and vegetables have gone east from California in wooden crates. With the help of the new cooling method, the crates are now giving way to paper cartons.

Together, the new methods are credited with cutting the cost of packaging, cooling and loading leafy vegetables into a rail car by one-fourth to one-half. Two 24-head lettuce cartons cost about 35 per cent less than one 48-head wooden crate. Labor costs are sharply trimmed by the elimination of ice-packers and other specialized help.

So far, the food most affected by the changeover has been lettuce. Each day during January about 200 refrigerator cars leave California's hot lush Imperial Valley stacked with lettuce for Eastern salad fanciers. About half of these are filled with paper cartons of vacuum-cooled lettuce. That's double the proportion shipped that way last season.

When lettuce starts rolling this spring out of the Salinas Valley in Central California, over 40 per cent of it will move in paper cartons, growers predict. Last year the amount was under 20 per cent; two years ago, only a trickle.

Started experimentally in 1948, vacuum cooling has grown swiftly. This year 13 plants, spread through Arizona-California growing areas, will be in operation. More are in the works. Over half the plants now running are owned and operated by Vacuum Cooling Co. of San Francisco. One big ice company, Monterey Ice & Development Co. of Salinas, went into vacuum cooling last year. Others are reported getting set to make the change.

Fruit Also Affected

Other produce ordinarily shipped by refrigerator car but not packed in ice is moving in heavier volume in paper cartons. Shippers have tried this method on such other perishables as cabbage, cauliflower, broccoli and Brussels sprouts successfully. This year about two-thirds of the nearly 20,000 carloads of lemons expected to be shipped from California, will be carton-packaged, according to Press Blount, an executive of Container Corp. of America. Two years ago almost all were shipped in wooden crates.

Of the about-100,000 carloads of apples due to be shipped all over the country this year, about 20 per cent will move in paper cartons, Mr. Blount forecasts. Last year the proportion was about 6 per cent.

Carton makers have their eyes on such other perishables as tangerines, apricots, plums and pears, all now shipped in wooden crates.

A & P Buyer Not Convinced

One unconvinced buyer is F. C. Kniesner, vice-president of Atlantic Commission Company, buying affiliate of the A & P chain. He says they haven't completely made up their minds yet; that while there are a lot of advantages to carton-shipped lettuce, it means a drier head that isn't always as attractive on the shelf.

One possible advantage for consumers is that such fruits as cantaloupes, strawberries and peaches may be picked nearer the point of ripeness when cooled by the vacuum process and shipped in cartons.

In the cast of produce not normally packed in ice, backers of the new packing and shipping methods admit the saving is less than with the more delicate vegetables. There is, however, a saving on freight because the paper containers weigh less than wooden crates.

Ice Carvings Attract Attention of Guests

ICE has an attractive attention value in restaurants and hotels and at parties when it's in the form of ice carvings or ice punch bowls. Typical of the appearance of these eye-catchers is the swan about which a Brown Derby chef is placing some of the day's delicacies, and the ice punch bowl which, at Ciro's frequently is converted into an artistically decorated champagne bucket.

Both are lighted, of course. In its original setting the swan glowed blue as a sapphire, and the champagne ice punch bowl had the deep richness of an emerald, if an emerald could be lighted from within. Invariably guests seeing them for the first time stopped to look carefully at this unusual ice, but patrons accustomed to the pattern of the Brown Derby of having a new, fresh set up every day for the past dozen years didn't fail to admire the swan and its display. Both spots are in Hollywood.

The first ice carvings were the careful work of Tommy Sherbloome who did each piece on order, by hand. As certain subjects were demanded repeatedly he began to study ways of eliminating the hand operation and after long trial and error developed foolproof, reusable molds from which ice punch bowls and the many different ice carvings now can be made by any ice company.

Standard tanks and facilities are all that are needed to use the molds. Doing so means greater use of those facilities and a stepped-up profit schedule. With the molds the manufacturer, Ice Carvings Company, provides disposable drain trays and liners which are so inexpensive they needn't even be picked up after a party. Colored lighting effects are also supplied. A well-rounded merchandising program is also available to simplify the selling efforts of the ice company making ice carvings.

Boys in Miami Battle With Snowballs Ice Man Furnishes the SNOW

YESSIRE - E - E — Snow flew in Miami, Fla. on Saturday, January 3, 1953. Place: Boys Club of Miami, Hank Kline, Director. Event: A forerunner of things to come as part of future Orange Bowl Classics—(we are told)—A real snowball battle-royal between teams of youngsters 10 to 12 years of age, and 12 years and over, wearing football helmets for protection.

Great fun was enjoyed by the kids, and the event was of such importance that it drew Newsreel and Television cameramen as well as the press to cover for news. Part of the battle was televised on WTVJ news section "Ralph Renick Reporting."

City Icers Fred Angel and Bill Lohman supervised getting the 30,000 pounds of snow to the football field, and Scotty Kever and Tommy Brown made the deliveries gladly to watch the fun.

This is like eating cake and having it, good publicity as well as contributing to the development of Youth.

Snowball battle in Miami—snow furnished by City Products Corp.

Tommy Sherbloome, chef at the Brown Derby, puts finishing touches on an ice carved swan.

An ice punch bowl has been converted into artistically decorated Champagne bucket.

Reports from Unit Ice Associations

Southwestern Ice Manufacturers' Association

BURDETTE BINNINGS
Secretary and Assistant Treasurer

THE Board of Directors of the Southwestern Ice Manufacturers' Association held its first meeting of the year in Dallas on January 16, 1953. Routine matters of finance and memberships were considered and the budget for the year established.

One of the matters of prime importance for consideration was the plans for the annual Convention scheduled to meet in San Antonio, Texas on April 8, 9 and 10, 1953 with the Gunter Hotel as headquarters. A slightly different schedule of activities was decided upon for this year. The Convention will open on Wednesday, April 8 with a Fellowship-Friendship-Cocktail Hour and Get-Together for all of the Convention attendants. This Fellowship-Friendship Get-Together on the first evening will replace the Board of Directors' dinner and the wives' dinner, which for this year have been discontinued.

Thursday afternoon, April 9, Mrs. Ralph H. Irvine, wife of the Association President, will give a tea for the ladies, in one of old San Antonio's most colorful settings. Thursday evening, the San Antonio members will be hosts to a party for the entire convention. On Friday evening, April 10, will fall the traditional president's dinner, floor show and dance.

The business sessions will be held Thursday and Friday, April 8 and 9 with two sessions each day, one in the forenoon and one in the afternoon. These four business sessions will consist of conferences on subjects of critical importance to the members of the Texas Ice Industry on the eve of their 1953 busy season. While the details for the business program are not complete at this time, an open forum session will be one of the outstanding features.

As the time of this Convention falls in the Spring, which is a new schedule for the Texas Convention, the tempo will be set on a theme of Spring. As everyone knows who has ever attended a convention in San Antonio, the locality itself lends a spirited note to any convention and the San Antonio members are delightful hosts, therefore a Spring-In-San Antonio atmosphere will predominate in the entire proceedings.

With the Convention ending on Friday night, the visitors will have the weekend for visiting in San Antonio or if desired, for a short trip into Mexico.

The Spring Merchandising Conference will be held again this year, a month or six weeks following the convention. Details for this conference have not been worked out, but it was strongly felt by the Board members that it is definitely needed, inasmuch as the program will be directed toward those in the sales and supervisory work of the ice organizations. More details on this conference will be announced at a later date.

It was also decided to hold the Fall Conference of Engineers. The time, place and program for this meeting will be decided later in the year by the members of the Technical Committee of the Association.

A very heartening response has been received to the Association's first appeal for the filing of membership dues for the current year. A letter to the membership was sent out over the signature of President Ralph H. Irvine, joined by the members of the Board of Directors, announcing the assessment for the year which was set up on the same basis as for 1952. The percentage of responses received up to this time indicates a very healthy situation existing in the Texas Ice Industry and it is believed that the majority of the key industry members are facing the 1953 season with, if not optimism, a strong determination to maintain and to build an even stronger Ice Industry in Texas than ever before.

Ohio Association Elects Officers

AT A MEETING of the Board of Directors held after adjournment of the annual convention, the Ohio Association elected the following officers:

President, Gilbert B. Bush, Jr., Gallipolis.

Vice President, Jack Whitelock, Warren.

Secretary - Treasurer, Elizabeth Shannon, Steubenville.

The Board of Directors for the ensuing year consists of the following members: Karl A. Beachy, Toledo; Walter B. Blessman, Akron; James S. Boardman, Columbus; Gilbert B. Bush, Jr., Gallipolis; George Curtain, Circleville; M. L. Ottman, Cleveland; Wm. R. Sneed, Hamilton; Jack Whitelock, Warren and Morgan G. Williams, Columbus.

Illinois Association of Ice Industries

WM. D. WRIGHT, SECRETARY

THE managers conference and directors meeting of the Illinois Association of Ice Industries was held as planned at Decatur, January 30. Attendance was good and interest high. Experiences were exchanged with respect to the business in 1952, sales trends, tonnage and revenue, problems and remedies, forecasts and plans for 1953. Much optimism for the future was expressed, black ink having been used, in some instances for the first time in recent years. In all it was a very satisfactory meeting.

The affairs of the association were discussed and it was the unanimous decision of those present that, in order to fit the program to our funds, and to prevent deficit financing, instead of the usual two day convention, involving banquet and entertainment, activities be confined to a one day meeting, a luncheon at noon, such outside speakers as seem appropriate at the time, election of directors and transaction of necessary association business, and then during the year, have more informal conferences held at strategic geographical locations, thus making it possible for all members to attend one of the meetings at least without having to travel a long distance.

In keeping with this decision it is announced that the annual meeting of the Illinois Association of Ice Industries will be held at the Emmerson Hotel, Mt. Vernon, Ill., Friday, April 24, 1953, starting at 10 a.m.

Many of the members plan on being in the hotel the night before, to meet their friends and do some visiting. For associate members, tables will be provided for small displays.

Vacationing in Southland

LATE word from Bill Wright, genial secretary of the Illinois Association of Ice Industries is that he and Mrs. Wright are now deep in the wilds of Mississippi, in Gulfport, and are soaking up some of the sunshine, warmth, beauty and waters of the Gulf. They expect to be there until after Easter. With an apartment in a hotel, maid service, and a view from their window over the Gulf they are enjoying life, particularly since they are escaping the rigors of a late Illinois winter. Friends can contact them care of the Crosby Hotel, Gulfport.

Missouri Valley-Kansas Joint Convention

THE joint convention of the Missouri Valley Ice Manufacturers Association and the Kansas Association of Ice Industries was held at the Hotel President, January 12-13.

The following speakers on the program gave very interesting and informative talks on their particular subjects: W. J. Ayers, President, National Association of Ice Industries, "The Ice Industry Today"; C. P. Austin, Director, Research and Engineering Department, National Association of Ice Industries, "It's Your National Association"; Max K. Doehler, Jr., Assistant Manager, Bruce Dodson and Company, Kansas City, Mo., "Hidden Profit Leaks in the Ice Industry"; E. J. Hund, Hund Ice and Cold Storage Company, Beloit, Kan., "More Profits for a Small Ice Plant"; B. J. George, Consultant, Kansas City Power & Light Company, Kansas City, Mo., "Ice Man! Keep Those Power Costs Down"; Richard C. Muckerman, City Products Corporation, St. Louis, Mo., "The New Ice Industry."

Tuesday morning an open forum discussion was held with J. R. Dean, Pure Ice Company, Cape Girardeau, Mo., as moderator. Panel members were: Matt Scherer, McPherson Ice Company, McPherson, Kan.; B. J. George, Kansas City Power & Light Company, Kansas City, Mo.; Ted L. Joule, Marketing Extension Service, Missouri University, Columbia, Mo.; R. C. Trieman, National Rejectors, Inc., St. Louis, Mo.; Tom Carroll, City Ice and Delivery Company, Wichita, Kan.; David H. Cornish, Monroe City Ice Company, Monroe City, Mo.; and C. P. Austin, National Association of Ice Industries. This was an outstanding portion of the convention program and many questions were asked and answered which were of interest to all present.

An outstanding floor show was presented at the dinner dance held Monday evening, January 12.

At the business session of the Missouri Valley Ice Manufacturers the following officers were elected:

President, Richard C. Muckerman, St. Louis

Vice-president, Harold Margolin, Kansas City

Secretary-treasurer, V. A. Esphorst, St. Louis

Directors: J. E. Campbell, Joplin; B. A. Welscher, Poplar Bluff; Harry Jacobs, Salisbury; J. R. Dean, Cape Girardeau.

Northwest Association Of Ice Industries

L. F. MARSH, Secretary

THE days of March 25-6-7 at the Empress Hotel in Victoria, B. C., will be busy and profitable ones for those of the ice industry who attend the annual convention of the Northwest Association of Ice Industries.

"Meat on Ice" will be a timely subject. Some of the members have done a very good job in developing this new and profitable project. They have found the answer to many problems that came up when they started and they are going to tell just what troubles they ran into and how they solved them.

Ken Sartori, Superintendent of Ice Departments for National Ice and Cold Storage Company of California will tell about new profitable operations in the ice business.

One of the leading refrigeration engineers, representing one of the oldest ice machine companies, Gilbert Harris, of Harris Ice Machine Works will talk about the efficient operation of refrigeration and ice making equipment.

Vending machines are a problem for many ice men at the present time, and there are going to be more and more in operation. One of the companies that know the most about how and why coin operated vending machines work, or don't work, National Rejectors Inc., has promised to have a representative at this convention to tell what they have found out about the operation of these machines, how to prevent troubles, and how to make profits with them.

Other subjects will be discussed, in fact the ones mentioned are just a start, that will spell out profits for the ice industry in 1953.

Oklahoma Association of Ice Industries

NEW and available markets for ice set the theme for discussions at the annual convention of the Oklahoma Association of Ice Industries held at Tulsa, January 18 to 20. Approximately 100 owners and managers of Oklahoma ice companies were present.

Principal speakers included Paul Andres, Oklahoma City, Vice-president of the National Association of Ice Industries who headed a panel discussion; Guy W. Jacobs, executive secretary of the National Association of Ice Industries and Morton Harrison, Tulsa, chairman of the state planning and resources board.

The president's banquet and dance was held Monday evening preceded by a social hour. At the banquet retiring president Earl Johnson of Oklahoma City was presented an award in recognition of his contribution to the Association during the past year.

Officers and Directors were elected as follows:

President, Charles D. Payne, Tulsa

Vice-president, Paul Liebmann, El Reno

Vice-president, Walter Brettain, Ardmore

Treasurer, Clyde Simon, Oklahoma City

Executive-secretary, Harry T. Hudson, Oklahoma City

Directors: Walter Brettain, Ardmore; George Hancock, Tulsa; Marvin Mills, Oklahoma City; Laurence Voelkers, Oklahoma City; Clarence Page, Purcell; Charles English, Shawnee; Ralph Hood, Guthrie; W. B. Moran, Shawnee.

Eastern States-Virginia Joint Convention

THERE will be a joint convention of the Eastern States Ice Association and the Virginia Ice Manufacturers' Association at the Chamberlain Hotel, April 9 and 10, 1953, at Old Point Comfort, Va. The area covered by these Associations includes the seven Middle Atlantic States in which nearly 40 percent of all the ice used in the United States is sold.

Last year the attendance at Alexandria, Virginia, was, we believe, exceeded only by that of the National Convention in Cincinnati. It will be a wonderful opportunity for associate members to contact and visit with this large gathering thereby reducing customer-calling cost to a minimum. Booth or table space will be available for exhibits.

We plan to have the best of the speakers that appeared at the National Convention and a concerted effort is being made by our 17 Directors to get out a much larger attendance than last year's.

Old Point will be beautiful in April with all spring flowers in full bloom. Historic Williamsburg, restored to its full Colonial grandeur by the Rockefeller Foundation at a cost of $63 million dollars, represents the show place of the area. The hotel is situated directly on Hampton Roads within two miles of the site of the famous Civil War battle between the Merrimac and the Monitor. And, many ships of war can be seen riding at anchor in the Roads at all times.

This will be an opportunity to see lots of ice men and enjoy Virginia hospitality at its best.

FrozenFoods

*Reg. U. S. Pat. Off.

PREPARATION PACKAGING FREEZING STORAGE DISTRIBUTION DESIGN CONSTRUCTION EQUIPMENT

Frozen Foods Outlook Called Good for 1953

FROZEN-FOOD packers and distributors look for another big sales year in 1953, according to opinions expressed at a forum discussion held at the regular luncheon meeting of the Eastern Frosted Foods Association. It was the consensus that prices will be moderately higher, that production will be ahead of any previous year, particularly in citrus-juice concentrates, and that there will be better handling of frozen-food products in their passage from producer to consumer.

C. L. Snavely, president of the National Association of Frozen Food Packers, and Warren J. Dills, general sales manager of Honor Brand Frosted Foods, led the discussion, and Jack Karger, president of Eastern Frosted Foods Association, introduced the speakers.

Mr. Snavely pointed out that frozen-foods production has doubled in the last five years. He asserted that frozen-food prices have declined 10 per cent in two years against the price index for all foods, which has shown an 8 per cent increase in the same period.

Industry profits on the whole are too small for good health and will have to be increased, probably through moderate price increases to the consumers, Mr. Snavely said. He said, however, that he looks for further savings through increased volume of production in the industry.

Mr. Snavely reported that the National Association of Frozen Food Packers in backing a five-year, $200,000 nutrition research program designed to show the nutritive and health values of frozen foods.

Mr. Dills estimated that frozen-foods consumption has grown to 3,000,000,000 pounds in 1952, against only 500,000,000 pounds ten years ago. In one month last summer, he said, 80,000,000 pints of orange and lemon frozen concentrates were consumed by the American people all over the country.

If the sales curve on frozen foods is down anywhere it is due to one cause, defrosting of the product somewhere along the line from the packer to the consumer, Mr. Dills said. He said the industry is now engaged in a campaign to lessen this abuse.

1952 Pack Frozen Peaches

THE 1952 pack of Frozen Peaches amounted to 33,662,932 pounds, according to a preliminary tabulation of the National Association of Frozen Food Packers. The 1952 total is slightly larger than the 32,380,150 pounds packed last year, and well above the volume packed in any year since 1946.

The regional pattern of production was not quite the same as in earlier years, even though the pack in the West continued to represent about two-thirds of the total. The Western pack as well as the pack in the South and the Northeast declined slightly from last year, but the pack in the Midwest more than doubled.

There was some change in container usage this year. The institutional and industrial pack increased a bit, while the retail pack declined. In addition, the use of the small retail tin container became an important factor this year. The pack in these containers (8 oz., 10 oz., 10½ oz., 11 oz., and 20 oz.) exceeded 4 million pounds, and accounted for about 37% of the total retail pack. Despite this development, the 12 oz. size (carton and metal end) gained further and continued as the dominant retail size. The 16 oz. size continued declining in importance.

Frozen Strawberries Pack Larger Than Last Year

EXCLUSIVE of California, the 1952 pack of frozen strawberries amounted to 145,931,607 pounds, according to a preliminary tabulation just completed by the National Association of Frozen Food Packers. This total was nearly 24 percent greater than the 1951 pack, but not quite as large as the record pack in 1950.

The large pack increase this year resulted from a tremendous jump in the total for Western states. Aside from California, the Western pack, primarily Washington and Oregon, increased from less than 52 million pounds in 1951 to 94½ million pounds this year. Reduced packs were indicated for the Northeast, South and particularly for the Midwest.

The most significant development in container usage this year was the emergence of the small retail can as an important container for frozen strawberries. Reports indicate the total pack in these cans (8, 10, 10½ and 11 oz.) amounted to nearly 15 million pounds.

Despite this new development, the 12 oz. size continued as the major retail package size for frozen strawberries, with a total pack of 34½ million pounds in this size. The importance of the one pound size declined further. Taken altogether, the pack in retail sizes this year accounted for 44 percent of the total, as against 40 percent of the total last year. Barrels and 30 pound tins continued as the most important large sizes used.

It should be emphasized that none of the totals released with this report include California, since data on production in this state are not yet available.

Produce Men to Combat Frozen Food's Inroads

REACTING to growing inroads into their sales volume by frozen and processed produce, members of the United Fresh Fruit and Vegetable Association, meeting in Los Angeles recently heard plans for a program of medical research by the association to establish the value of fresh produce. This will be accompanied by a publicity campaign to publicize the health value of fresh produce.

Richard A. Waldsmith, president of the association, told the 3,500 growers and shippers at the group's 49th annual convention that while 76 per cent of all fruits and vegetables were marketed fresh in 1948, the percentage by 1951 had dropped to 71 and was probably still lower last year.

"These statistics," he said, "look somewhat better than they are. Some of our principal items are not adapted to processing to any great extent, including potatoes, bananas, onions, lettuce, celery, melons and others. Omitting these, the percentage of other fruits and vegetables used fresh in 1951 was 57 per cent, against 64 per cent in 1948."

Frozen Foods

1952 Pack Frozen Cut Corn Reaches All-Time High

THE pack of frozen cut corn increased again this year and reached another all-time record high. A preliminary tabulation by the National Association of Frozen Food Packers indicates a 1952 pack of 56,562,522 pounds. This total is 27 percent greater than the 1951 pack of 44,548,410 pounds, the largest pack prior to the current year.

All regions reported larger packs than in 1951, but the greatest increases were in the Midwest and in the West. The Midwest pack was roughly two-thirds greater than in 1951, while the Western pack was up approximately one-third.

Container sizes showed some changes from preceding years. The use of large sizes over 10 pounds (exclusive of 30 and 50 pounds) was approximately three times as great as last year. (The 55 pound size is very important in this category.) The use of the 50 pound size declined about 42% from 1951 to 1952.

There was a substantial increase in the retail pack. The total for this category in 1952 was 21,857,083 pounds, as compared to 16,824,506 pounds in 1951. Most of the retail pack was in the 10 oz. size, but there was appreciable production in 8 oz. and 12 oz. sizes.

Frozen Fruit Production Sets New High Record

THE 1952 commercial pack of frozen fruits and fruit juices is tentatively estimated at 985 million pounds, 23 percent larger than the 1951 pack, and a new record according to the Bureau of Agricultural Economics, USDA.

Among deciduous fruits, production of frozen strawberries exceeded 200 million pounds, about 30 percent larger than in 1951 and also a new high. The peach pack of about 34 million pounds was nearly four percent larger. The pack of frozen cherries, however, was down 39 percent to 62 million pounds, partly as a result of storm damage to the cherry crop. Total output of frozen deciduous fruits and berries was over 400 million pounds, down four percent from 1951.

Production of frozen citrus juices continued its upward trend in 1952, reaching a new high of approximately 580 million pounds. This was an increase of 52 percent over the 1951 pack. About 494 million pounds, or 50 million gallons, of the 1952 output consisted of frozen orange concentrate processed in Florida and California. This was an increase of 48 percent over 1951. Output of other frozen citrus items, especially concentrated grapefruit juice and lemonade base, was much larger than the preceding year.

The 1952-53 season for freezing citrus juices in Florida got under way in early December, 1952. By January 10, 1953, about 6.4 million gallons of frozen orange concentrate had been made. This was about three times comparable output of 1951-52.

Prices paid by packers to growers for oranges for making into frozen concentrate were considerably higher in early January, 1953, than in the same period of 1952.

During four weeks of December 1952, household consumers purchased an estimated 38 million gallons of the concentrate, nearly half again as much as in four weeks of December 1951.

Civilian per capita consumption of frozen fruits and fruit juices in 1952 is tentatively estimated at 6.5 pounds, basis weight of the frozen product. This is an increase of 38 percent over consumption in 1951 and a new record.

USDA Proposes Changes in Poultry Grading Regulations

THE U. S. Department of Agriculture has proposed minor changes in its poultry regulations to reduce the miminmum number of containers of poultry required to be examined as a representative sample under its official grading program.

The change has been proposed as a means of speeding up the grading of poultry to increase the efficiency of the service. Experience has shown that accurate grading of poultry of uniform quality can be accomplished by examining the contents of fewer containers than is now required. However, when poultry of irregular or varying quality is involved, graders, under the proposal, would be instructed to examine at their discretion as many additional containers as necessary to establish the grade of any lot.

The proposed change would require the grading of all containers in lots of 3 or less, of 3 containers of 4 to 20, of 5 in lots of 21 to 50, of 7 in lots of 51 to 140, and of 5 per cent of the total in lots of 141 or more. Present regulations require the grading of all containers in lots of 3 or less, 3 in lots of 4 to 10, 4 in lots of 11 to 20, 7 in lots of 21 to 50, 10 in lots of 51 to 100, and 10 per cent in lots of more than 100.

Refrigerated Truck Tests Of Frozen Foods

RESULTS of two additional cross-country shipments of frozen foods, by the Production and Marketing Administration in a study of frozen food transportation have been announced. A part of the test was a mechanically refrigerated trailer loaded with frozen turkeys, carried from Modesto, Calif., to Medford, Mass. and on the return trip of frozen orange juice concentrate from Plymouth, Fla. to Los Angeles.

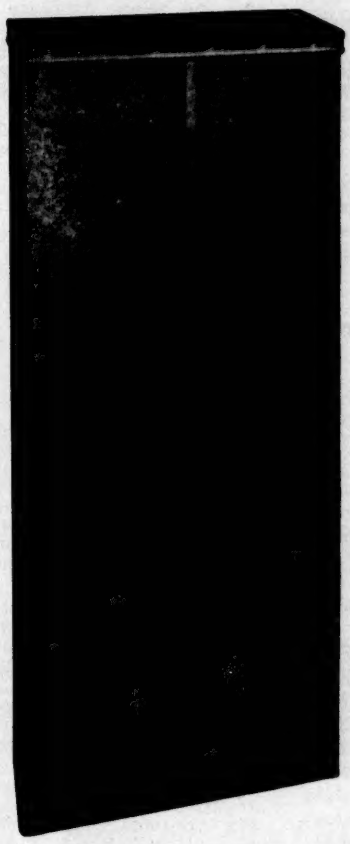
After traveling time of twelve days, average temperature of the frozen turkeys was minus 18 F on top and minus 11.3 F on the bottom. The orange juice concentrate at the end of a six-day haul had an average unloading temperature of minus 8.5 F, compared with the loading reading of minus 6.6 F.

The Minute Maid Company, whose concentrate was used for the return trip was reported as highly pleased with the results. According to J. A. Podmore, general traffic manager of Minute Maid, a study of the temperature readings showed that the only cases which showed a rise in temperature were on the bottom of the load and all but one of these was along the bottom row next to the side wall. They had rather expected this he said, because the trailer was not properly equipped with adequate side wall strips. While the floor was equipped with special floor racks to provide more than the usual amount of air flow under the load, in their opinion, it was still inadequate. These conditions have already been corrected in the trucks the company uses.

On the initial trip when 30,000 pounds of frozen turkeys were shipped for the California Turkey Grower's Association in November, consistent good readings were obtained. Average top and bottom readings did not rise above 0 F.

Protecting Frozen Foods

A BOOKLET "Protecting Frozen Foods" has been issued by the National Association of Frozen Food Packers. It points out that frozen foods require protection, all the way from packer to consumer to prevent loss of flavor, and preserve appearance and nutritional value, the protection required being principally low temperature refrigeration, 0F or lower. Under a heading "What to Do About it," specific suggestions are made to packers, distributors and retailers as to what they can do to maintain quality of product. Copies are available from The National Association of Frozen Food Packers.



Welded Cans
Integral Tube Cans
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Can Baskets
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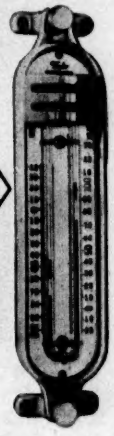
Industrial Trucks and Trailers

THE OHIO GALVANIZING & MFG. CO.
NILES OHIO

ON THE WALL

Taylor Wall Thermometer No. 1106. Accuracy guaranteed to within plus or minus 1°F. 12" high-gloss white baked-on synthetic enamel finish case, can be attached to wall or post by lugs at top and bottom. Flanged edges protect tube, riveted clasps prevent it from slipping. Large, easy-reading lens-front tubes filled with red liquid. Ideal for Cold Storage Rooms. Range: minus 40 to +70° in 1° divisions.

Price: $2.75.



Taylor Six's Maximum-Minimum Thermometer No. 5448. "Set" by moving the "index" in each side of the glass tube to top of mercury column with a magnet. As temperature changes, mercury rises in one side, falls in the other, leaving "index" to show highest or lowest temperature since last setting, as well as present temperature. Gray moulded plastic case, 10" scale. Ranges: Minus 40 to +120°F, minus 40 to +50°C.

Price: $7.50.

...or in your POCKET

Taylor Pocket Test Thermometer... for general testing. Handy to carry—easy to read, thanks to exclusive BINOC* tubing that provides wide angle vision and high magnification. Red liquid or mercury filled, comes complete with metal case. Just 5½" long.
No. 21410, minus 30 to +120°F, mercury filled.
No. 21412, minus 50 to +120°F, red liquid filled.

Price: $1.65 complete.

Taylor Instrument Companies, Rochester, N. Y., and Toronto, Canada. *Instruments for indicating, recording and controlling temperature, pressure, flow, liquid level, speed, density, load and humidity.*

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Taylor Instruments
MEAN
ACCURACY FIRST
IN HOME AND INDUSTRY

Henderson Leaves ACRMA Joins Direct Mail

SEVERING his connection as executive vice-president of the Air Conditioning and Refrigeration Machinery Association, for several years, Wm. B. Henderson has joined the Direct Mail Advertising Association with headquarters in New York City. He was also first secretary of Machinery and Allied Products Institute and aided in the founding of the organization in 1933.

Wm. B. Henderson

Born and educated in Toronto, Canada, he has lived in the United States most of his life. In World War II he was a U. S. Navy Intelligence officer in the South Pacific. Bill considers his new post a real challenge, but he will be greatly missed by his associates in the air conditioning and allied fields.

Practical Refrigerating Engineers Association

REPRESENTATIVES of the Wright Chemical Company spoke at the January 7 meeting of the Practical Refrigerating Engineers Association on the subject of "Chemicals For Preventing Corrosion." Guest speakers were Del Walser and Messrs. Merle, Butler, Pasowitz, Kanisky, Kruesch, and Reynolds. The panel discussion included the subject of "Operating Kinks" covering the problem of sludge and corrosion from storage tanks.

Eighty members were present for the January 21 meeting. An interesting talk on the history of refrigeration, particularly relating to the manufacturing of ice was given by Donald Haskins, sales manager of the Murphy & Miller Company. Mr. Haskins was accompanied by his associates Messrs. Becker and Casey. The panel discussion was a spirited talk on operating costs, particularly relating to power and water for the condensing cycle.

Training Conference

(Continued from page 27)

enbrenner, Jim Kuehn, and Dr. J. G. Woodroof of Georgia Agricultural Experiment Station served as a panel to discuss such subjects as storage of lead acid batteries, resins for use in plastics, cocoa powder, coffee, frozen baked goods, rubber products, florists stocks, cut flowers, and other commodities. Dr. Woodroof, who is well known among refrigerated-storage men, discussed particularly candies and nuts and Army C rations.

Training Conference Covers Warehousing Problems

ANOTHER training conference for refrigerated warehouse personnel will be held at the Municipal Auditorium, San Jose, Calif. March 15-19, directed by the Refrigeration Research Foundation and under the auspices of the National Association Refrigerated Warehouses.

The conference will start Sunday evening March 15 with a get-together session and cocktail hour at the Ste. Claire Hotel. Millard Young, San Francisco, president of the Pacific States Cold Storage Warehousemen's Association will welcome members of the conference. Lectures start Monday morning and will continue with morning, afternoon and evening sessions until Thursday noon. Thursday afternoon visits will be arranged to San Jose and Santa Clara Warehouses or the Western Regional Research Laboratory, Albany, Calif.

Refrigeration and Air Conditioning Conference Seattle, April 24-26

A REFRIGERATION and air conditioning educational exhibit and conference will be held at Seattle, Wash., April 24-26, sponsored by the Refrigeration Service Engineers Society and the Refrigeration Equipment Manufacturers' Association.

Seattle's new Field Artillery Armory will be used to house the educational exhibits. Meetings will be held in an adjoining room. The educational program will consist of a series of talks on each of the three days by leading experts in the fields of refrigeration. Illustrated lectures will be given on technical subjects dealing with installation and service problems. The educational exhibit will consist of displays by many of the leading parts manufacturers.

A banquet and floor show Saturday night will provide entertainment for all. A special program is being arranged for the ladies.

Sales and Reorganizations

Connersville, Ind. — The Connersville Ice Company has been purchased by the Home City Ice Company, Sayler Park Station, Cincinnati, Ohio. The Home City Ice Company is owned and operated by Mrs. F. J. Sedler and son, F. P. Sedler.

Blue Rapids, Kans. — The Blue Rapids ice plant has been sold by L. L. Meiers to his son Dean L. Meiers who has been with the Southwest Ice Company at Osawatomie for several years.

New Orleans, La. — The Commission Council has agreed to pay $300,000 for the Herman Ice House property which is needed for widening Loyola Avenue.

Fire and Accident Record

Selma, Calif.—Fire in the Central California Ice Company plant caused damage estimated at $35,000. Exploding ammonia cylinders hampered firemen.

Grand Rapids, Mich.—Fire caused by the explosion of an oil burning salamander destroyed a building and damaged another at the Darling & Co. meat processing plant. Damage was estimated at $5,000.

Odessa, Tex. — Loss estimated at $100,000 was the result of a recent fire that swept through the Banner Creamery plant, a distributing station for bottled milk and an ice factory.

Decatur, Ill.—Damage estimated at $200,000 resulted from a fire that destroyed the rear half of Consumers Ice & Coal Co. The fire completely gutted an addition housing four trucks and destroyed the engine room and tank room. Cause was attributed to defective wiring.

New Incorporations

New Orleans, La.—Jefferson Cold Storage Inc., 505 Hibernia Bldg., has been granted charter of incorporation listing capital stock of $40,000.

Icy Items

Fairfield, Ill.—The business of the Fairfield Ice & Coal Co. was discontinued as of December 31. James H. Cox and Ira Yoho are now the ice dealers in Fairfield, operating under the name of The Fairfield Ice Co.

Pacific Fruit Express Buys Refrigerator Cars

THE Pacific Fruit Express Co., owned jointly by Union Pacific and Southern Pacific Railroads, has ordered 200 additional refrigerator railroad cars, to be used especially for the transportation of frozen foods. These "super giants" are longer than conventional 40-foot cars and have 50 percent thicker insulation. One hundred of them will be mechanically refrigerated and capable of maintaining zero temperatures. They are similar to 25 new cars the company expects to place in service this spring.

TWO NEW ALL-STEEL ICE CRUSHERS by *BATEMAN*

Regal MODEL 25

The New REGAL Model 25 has all steel frame legs, grate handle and grate. Self-aligning ball bearings. Legs high enough for 25-lb. paper bag to be filled. Galvanized for the prevention of rust. ¾ HP. motor. Direct drive, no gears. Shelf for placing ice on before entering hopper. Slanting hopper for easy loading. Four grate adjustments by turning the handle on side of crusher. Makes a very good fine ice on grate closed. Will take long 50-lb. blocks in hopper. Two belts for sure pulling power. Belts and motor pulley furnished when crusher is ordered without motor. Delivery can be made on receipt of order. Guard covers the flywheel and motor pulley.

Price $149.00, less motor. Motor at prevailing price.

Monarch MODEL 50

The Bateman all steel MONARCH Model 50 Ice Crusher is galvanized for the prevention of rust. Slanting hopper for easy loading, with shelf for placing ice on before entering crusher. Hopper opening—12½"x15". Uses 1 HP. motor with V-belt drive. All moving parts move on either ball or roller bearings. Gears are of alloy steel hardened for long life and trouble free. Steel shell, legs, grates, grate handle and alloy steel teeth. Belts and pulley furnished when crusher is ordered without motor. Side plates and bottom of hopper 3/16" steel.

Price $235.00, less motor. Motor at prevailing price.

WRITE FOR DESCRIPTIVE LITERATURE

Bateman **ICE PROCESSING EQUIPMENT** MINERAL WELLS TEXAS

The Hamer Method of
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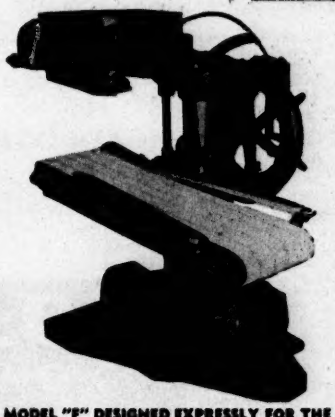
ICE CUBES and CRUSHED ICE

The Hamer Bag Closing Machine in action at the Jefferson Ice Co. in Chicago.

More and more ice companies are installing the Hamer Bag Closing Machine to cut labor costs, avoid jam-ups during peak seasons and meet state health and food sanitation requirements.

SAVES LABOR

The Hamer Bag Closing Machine is fully automatic completely eliminating costly hand closure methods. It speeds up your operation and slashes your bill for labor. Closes all sized paper bags from 5 to 100 lbs. Handles filled bags from a few to as many as 1200 per hour.



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Address .....
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CONVENTION CALENDAR

ALL-INDUSTRY FROZEN FOODS CONVENTION
March 1-4, 1953
Conrad Hilton Hotel, Chicago, Ill.

NORTH CAROLINA ICE ASSOCIATION
March 9-10, 1953
Robt. E. Lee Hotel, Winston Salem, N. C.
LEWIS POWELL, Secretary

NORTHWEST ASSOCIATION OF ICE INDUSTRIES
March 25-27, 1953
Empress Hotel, Victoria, B. C.
L. F. MARSH, Exec.-Secy.

SOUTHWESTERN ICE MANUFACTURERS ASSOCIATION
April 8-10, 1953
Gunter Hotel, San Antonio, Texas
P. A. WEATHERRED, Secy-Counsel

EASTERN STATES ICE ASSOCIATION
April 9-10, 1953
Hotel Chamberlain, Old Point Comfort, Va.
GORDEN T. WILSON, Secretary

VIRGINIA ICE MANUFACTURERS ASSOCIATION
April 9-10, 1953
Hotel Chamberlain, Old Point Comfort, Va.
H. H. SNYDER, Secretary

INDIANA ASSOCIATION OF ICE INDUSTRIES
April 15-16, 1953
French Lick Springs Hotel, Ind.
ROBT. W. WALTON, Secretary

ILLINOIS ASSOCIATION OF ICE INDUSTRIES
April 24, 1953
Emmerson Hotel, Mt. Vernon, Ill.
WM. D. WRIGHT, Secretary

THE REFRIGERATION RESEARCH FOUNDATION
May 15-17, 1953
Shoreman Hotel, Washington, D. C.
H. C. DIEHL, Director

NATIONAL ASSOCIATION REFRIGERATED WAREHOUSES
May 17-21, 1953
Shoreman Hotel, Washington, D. C.
WM. DALTON, Exec. Vice-Pres.

AMERICAN WAREHOUSEMEN'S ASSOCIATION
May 17-21, 1953
Shoreman Hotel, Washington, D. C.
WM. DALTON, Exec. Vice-Pres.

NATIONAL ASSOCIATION PRACTICAL REFRIGERATING ENGINEERS
November 11-13, 1953
Purdue University, Lafayette, Ind.
J. RICHARD KELAHAN, Secretary

Burlington Acquires New Type Refrigerator Cars

THE Chicago, Burlington & Quincy Railroad plans to acquire 30 new heavily-insulated, mechanically-refrigerated cars with automatic thermostatic controls. The new cars will be leased to the Burlington Refrigerator Express Co.

The cars are so designed that a temperature range from zero to 70 degrees above can be maintained, making them suited for the transportation of frozen foods, requiring low temperatures, or tropical fruits and other commodities needing higher temperatures in transit.

They will be 50 feet long, 10 feet longer than conventional refrigerator cars, affording from 30 to 50 percent more loading capacity. An innovation is plug-in, fixed-ceiling lighting which will facilitate loading and unloading. Fruit Growers Co., Indiana Harbor, Ind., is expected to build the cars.

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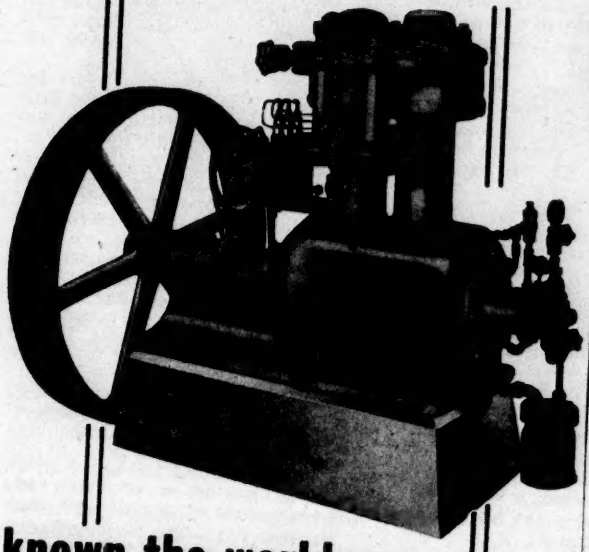
Sterling

REFRIGERATION EQUIPMENT



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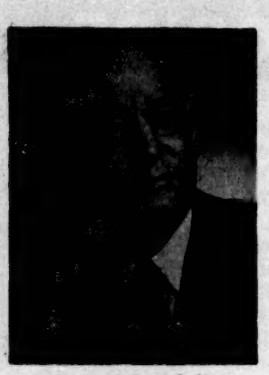
DEATHS

Howard Campbell

THE death of Howard Campbell, vice-president, Southland Corporation, Dallas, Texas occurred from a heart attack at his office, at noon January 28, 1953, at the age of 57.

Mr. Campbell was among the best known and best loved men of the Texas Ice Industry. He came to Dallas over a quarter century ago from Brady, Texas, where he was born, and became associated with the late C. E. Kennemer. For many years he was Mr. Kennemer's closest associate and "right hand man." When the operations headed by Mr. Kennemer were taken over by Southland Corporation, Mr. Campbell became vice-president in charge of Dallas and Fort Worth and other properties of the extensive Southland Corporation.



Howard Campbell

From time to time he has served as a member of the Board of Directors of the Southwestern Ice Manufacturers' Association. He was a Methodist, and a member of the Rotary Club of Dallas and the Salesmanship Club. Throughout his career he was wholeheartedly devoted to the building up and to the betterment of the ice industry to which he was devoted. He was ever progressive, ever forward looking, ever working toward improvement, not only of his own company but of the industry as a whole. He knew not discouragement.

While Howard Campbell lived out the career of a leading figure in the ice industry of two of the largest Texas markets and went through conflicts and vicissitudes inherent in such a career, still he was respected and loved alike by competitors and associates. His wholehearted attitude was always that of cooperation and understanding, and of friendliness.

He is survived by his widow, Mrs. Nettie V. Campbell, of Dallas, and by his mother, Mrs. Elma Campbell, and a sister, Mrs. N. G. Lyle, Jr., both of Brady, Texas.

Harry S. Mayall

THE death of Harry Stanley Mayall, Seattle refrigeration and air conditioning engineer, occurred January 28. He was stricken with a heart ailment a few days before his death. He was 64.

Mr. Mayall was district commercial supervisor for the York Corp., refrigeration and air-conditioning manufacturer. He became associated with the firm when he came to Seattle in 1929 and had held his present post nine years.

A former engineer and pioneer in the ice-machine business in Spokane, he was general manager of the Armstrong Ice Machinery Co. there in the early 1920's. He went to Spokane in 1903 and entered the refrigeration field with his father.

A native of Manchester, England, Mr. Mayall was educated at Eden College, England, and in Belgium. He was active many years in the American Society of Refrigeration Engineers.

Glenn H. Genger

THE funeral of Glenn H. Genger, 59, of Park Ridge, a vice-president and director of City Products Corporation, was held Monday February 16 in the chapel at Park Ridge. He died February 13 at his home. Mr. Genger, who had been with the company for thirty years, came to Chicago from the company's Cleveland office in 1943. He was in charge of retail operations. He was a World War I veteran. Surviving are his widow, Mrs. Marie H. Genger, a daughter, Mrs. Marian Smith, a son, Bert H. Genger, his mother, Mrs. Noah D. Genger, and one grandchild.

PAUL W. SPRADLING, co-owner of the Lamar-Missouri Ice Company, died January 25. He was 57. He was a member of the Lamar City Council, The American Legion, the Masonic lodge at Lamar and Abou Ben Adhem Shrine at Springfield.

HERBERT KOWALKE, Milwaukee, Wis. formerly operator of the North Lake Ice Co. died November 24. He was 55. He is survived by his widow, Mrs. Amanda Kowalke and three daughters.

MADISON M. TENNISON, independent ice dealer in Dallas, Tex. for more than 30 years died January 20 after a brief illness at the age of 78. He was born in Missouri but had lived in Dallas since 1892. He is survived by his widow, a daughter and three sons.

PETER GIUSTO, assistant superintendent of the Union Terminal Cold Storage Co. Jersey City, N. J. died February 5. He was 41. Surviving are his widow Mrs. Grace Cassella Giusto, five sons and four daughters.

New Plants and Improvements

Phoenix, Ariz. — A new vacuum precooling plant for lettuce will be erected in the Salt River Valley by the Crystal Ice & Cold Storage Co. It will be the same size as the one put in operation by the company last November.

Holtville, Calif.—The Holtville Ice & Cold Storage Co. has added a new addition to house a vacuum cooling plant for lettuce.

Morro Bay, Calif.—A refrigeration plant on the docks at Morro Bay is planned by the General Refrigeration Service of Santa Maria to service the catch of fishermen.

New Haven, Conn. — The New Haven Cold Storage & Warehouse Co. has installed a new blast tunnel with approximate capacity of 30,000 lbs. per 24 hours.

Decatur, Ill. — The Consumers Ice & Coal Company will rebuild at least a part of the ice plant which was damaged by fire recently.

Morgan City, La.—A 30-ft. extension has been added to the Peoples Ice & Storage Company wharf to accommodate deeper draft vessels with their boat-icing service.

Lancaster, Pa.—The Lancaster Cold Storage Co. has completed a new one-story addition with 20,000 cubic feet of freezer space. The company plans to convert all of its 150,000 cubic feet of cooler space to freezer space.

Celina, Tenn. — C. E. Clark and William Moulton plan establishment of a strawberry freezing plant here to process berries produced in the area. Present plans are based on an expected production of about one million pounds of berries next year.

Houston Tex.—The Houston Terminal Warehouse & Cold Storage Co. has increased its refrigerated zero space to approximately one million cubic feet as a result of getting into operation a holding freezer of 150,000 gross cubic feet.

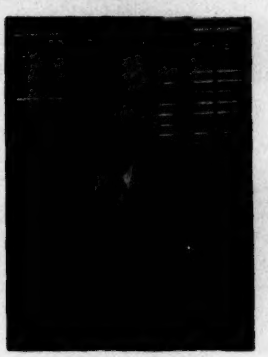
Seattle, Wash. — The Milwaukee Sausage Co. plans an addition to the building at 2900 Fourth Avenue South to enlarge its refrigeration and storage facilities.

Soldering Joints Simplified

SOLDER joints in five simple steps! It can be done. One of our leading brass and copper manufacturers has illustrated it in recent advertising. One—polish the outside of the tube and inside of the fitting with No. 00 steel wool or fine grade sand cloth. Two—apply thin coat of flux to tube and inside of fitting. Place fitting on tube and remove excess flux. Three—heat joint evenly with a blow-torch. Remove flame and apply solder to joint. Solder will melt from wire at correct temperature. Four — capillary attraction draws solder into joint. When solder shows around edge of fitting, connection is completed. Five — remove excess solder with a brush. Do not place strain on joint until it has cooled.

Knox Elected to Life Membership in A.S.R.E.

HAVING been a member in good standing for thirty years, Charles Knox, vice-president and Works Manager of Baker Refrigeration Corporation was recently notified that he had been elected to life membership in The American Society of Refrigerating Engineers.



Charles Knox

Mr. Knox recently completed forty-two years of service with the Baker organization. He received his early mechanical engineering training in Polytechnical Institutes in Friedberg, Germany, and Darmstadt, Germany, graduating in 1908. Upon returning to the U. S. in 1909 he joined the concern of De La Vergne Machine Co. in New York where he worked in the assembly department of refrigeration machinery.

He joined the Baker Ice Machine Co. Inc. in Omaha in 1910 as a field installation engineer, and from 1912 to 1916 handled sales and application design engineering. From 1918 he was in charge of all engineering.

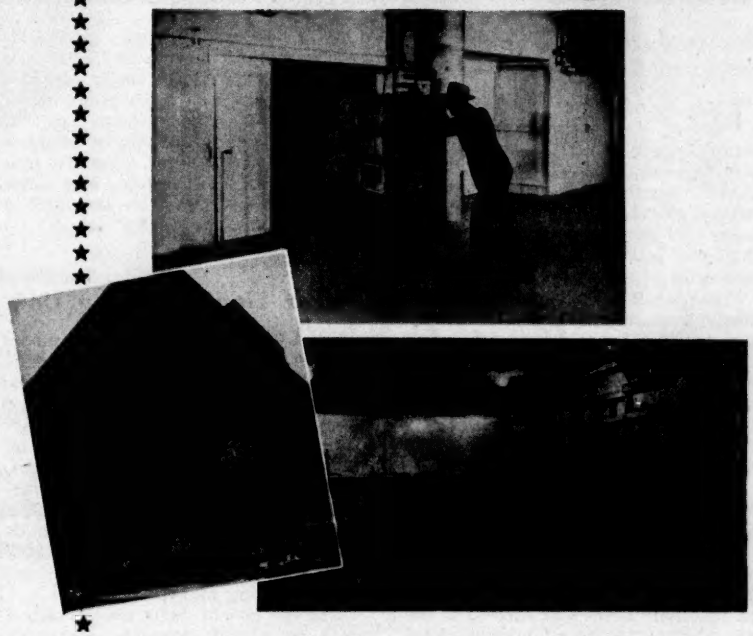
Soon after the Baker move to South Windham, Maine, he became works manager. Recently appointed vice-president, he will continue to have general supervision of all production manufacturing.

Mild Weather Delays Natural Ice Harvest

THE ice harvest at Detroit Lakes, Minn. started all over again early in February. A crew of 80, working for the Addison-Miller Company of St. Paul returned from Helena, Mont. and expected to cut 2,400 tons to wind up this year's activity. Operations in Helena were halted because of mild weather which honeycombed the ice. Company officials said that temperature in the 50's and 60's forced an end of harvesting there. The company furnishes ice for all main points of the Northern Pacific Railroad Company.

At Merchants Cold Storage Company of Cincinnati...

It's VILTER Again



As demand for frozen foods soars, Merchants Cold Storage Company has been quick to expand its sharp freezing and holding facilities. Latest Vilter installations at Merchants enable them to quick freeze 120,000 pounds of products each day in each of several tunnels.

After experience with other equipment, Vilter became the choice for the newest installations at Merchants Cold Storage Company. Vilter Blast Freezers and Vilter Air Units take care of freezing and holding, respectively. A difficult problem, where a long, narrow room had to be cooled, was solved with Vilter Air Units having distributing cowls that can be rotated to direct cooling to points where it is needed most.

In refrigeration that does a better cooling job more economically... in engineering help that really *fits* the equipment to the job, Vilter users know that they get more for their money. They save, too, in repair and maintenance costs when they use Vilter refrigeration. No wonder you see more and more Vilter refrigeration.

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What's New

MACHINERY
APPLIANCES • PROCESSES

Ice-scalator for Bunker Icing of Refrigerator Cars

THE "Ice-scalator" for bunker icing of refrigerator cars has gone into production at Tri-Pak Machinery Service, Inc. of Harlingen, Texas. After months of experimentation with Central Power and Light Company of Harlingen, the new "Ice-scalator" solves many of the complex problems of "reefer" icing.

The escalator is mounted on a trailer and can be towed by the icing truck. The frame is telescoped for travel and then cranked up to an extended operating height. Then a delivery chute is swung around to the refrigerator bunker. The delivery chute also telescopes so that ice can be delivered to either bunker.

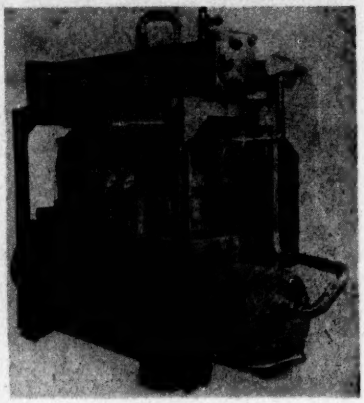
The escalator is powered by a 2 hp gasoline motor. Ice is broken into 50 to 75 lb. chunks. An inclined tray built into the trailer bed allows the chunks to slide to the "Ice-scalator." The ice is picked up by metal cleats on the chain drive and carried to the top where it drops off into the telescoped delivery chute and on to the "reefer."

The "Ice-scalator" can ice refrigerator cars at the rate of 750 lbs. per minute or more. It is easily operated by two men, allowing a great saving in labor costs. It eliminates many of the hazards and dangers of methods now used in "reefer" icing. Its mobility, ease of operation, and labor saving cost makes "Ice-scalator" a great advance in "reefer" icing.

Baker Liquid Chilling Unit

A NEW 10 h.p. liquid chiller, model WCU-10-1005X has been designed by the Baker Refrigeration Corp. This new unit is pre-engineered, fabricated and completely assembled at the factory. Unit sizes 30 to 60 h.p. can be fabricated and shipped knocked down at the customers option to accomodate installation requirements. The size units available are from 10 to 60 h.p., giving water cooling capacities of 22 gpm to 160 gpm through a ten degree cooling range.

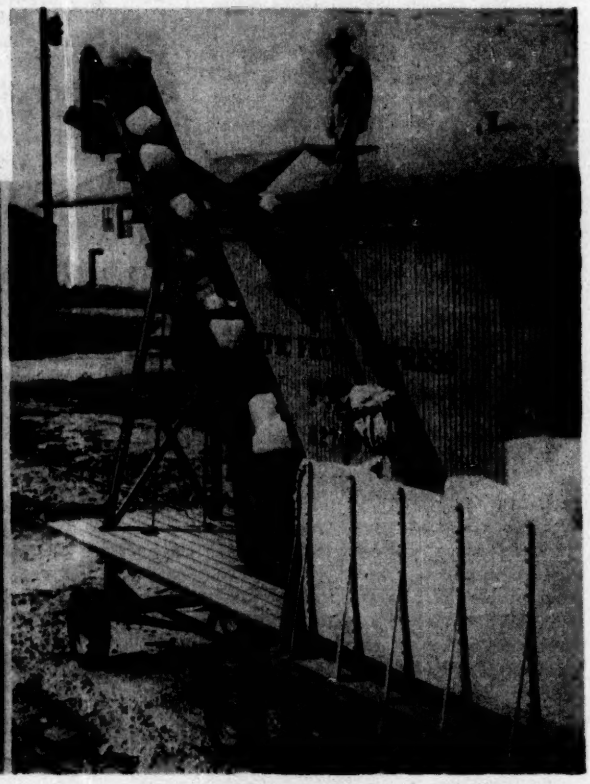
The component parts are furnished in a completed assembly consisting of a compressor, motor, gauge board assembly, dual pressure control, condenser, chiller and heat exchanger mounted on a structural steel base and frame. A thermostatic expansion valve, liquid line solenoid and strainer, liquid sight glass, fusible plug or relief valve, thermostat and charging valve plus interconnecting refrigerant lines are also included.



New Baker Liquid Chilling Unit

Below: The ice-scalator is being moved into position to start elevating ice for placing in bunkers of refrigerator cars.

Right: Blocks of ice are being elevated to top of refrigerator car where workman feeds it into the bunkers.



There is no substitute for water

. . . and there is no substitute for EXPERIENCED ENGINEERING in developing a dependable water system.

Let Layne engineers help you plan ahead on your water needs. Contact your nearest Layne Associate Company or write Layne & Bowler, Inc., Memphis 8, Tenn.

Layne

Water Wells
Vertical Turbine
Pumps

ACME . . . *the Only Gas Mask With the* 'PICTURE WINDOWS'

You never have that "jammed-in" feeling, wearing the Acme Full-Vision Gas Mask. Its patented, larger lenses are like picture windows, giving you full natural vision for that safe, unconfined feeling. When you walk, you can actually see your toes without bobbing your head. This factor alone makes Acme outstanding among gas masks . . . well worth looking into.

Write for the complete story on Acme Gas Masks for The Refrigeration Industry

Acme Protection Equipment Co.
3037 West Lake Street, Chicago 12, Illinois

HOW COLD IS AN OYSTER?

It all depends on what's being done to him. On shipboard he's kept at bed water temperature, he's quick-frozen at minus 20 F., and held in storage at minus 10 to 12 F. The *exact* temperature is all-important to keep him in top-profit condition.

Whatever your product, or temperature requirement, HOWE engineers have the know-how to solve your particular refrigeration problem. Through HOWE'S job-proved economies, you can cut operating and maintenance costs to a minimum. HOWE Compressors have interchangeable parts . . . a money-saving advantage. Whether you need a new plant, or must re-design your old one, HOWE can do it for you economically . . . *exactly!*

41 YEARS OF SPECIALIZATION INSURE SAVINGS

Since 1912, manufacturers of ammonia compressors, condensers, coolers, fin coils, locker freezing units, air conditioning (cooling) equipment.

Write for literature

HOWE ICE MACHINE CO.
2829 MONTROSE AVENUE • CHICAGO 18, ILLINOIS
Distributors in Principle Cities • Cable Address: HIMCO, Chicago

HOWE POLAR CIRCLE COILS produce 6-way savings! Built for heavy duty in meat packing, ice cream, quick freezing, ice and cold storage plants. Provide improved refrigeration that assures better product control. Write for details.

Pocket Safety Test Light

A NEW pocket-size Test-Glo lamp has been announced by Ideal Industries Inc., Sycamore, Ill. The new tester was designed to combine maximum safety with ease of use. It can be used for checking electric circuits, spark plugs, motors, fuses, and a variety of electrical equipment. Capacity includes voltages from 80 to 600—A.C. or D.C.

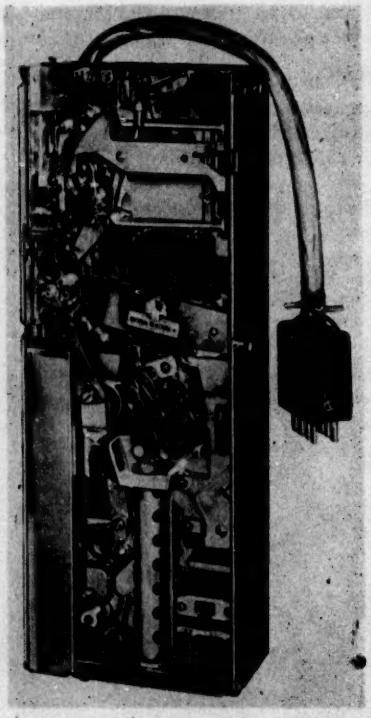
Unusual safety features of this new tester includes a 24-inch lead wire between test prods, permitting wide span; 5-inch prod handles for deep probing; safety-rings on prods to prevent fingers contacting tips; 10,000 Volt lead wire; high grade resistors between each prod and lead to limit voltage in the lead; neon lamp at front of prod in line-of-vision; all parts sealed against moisture.

New Coin Changer

A NEW automatic coin changer has been introduced by National Rejectors, Inc., St. Louis. Called the "4-in-1" Changer, the new device is the first to feature one coin insert that will take pennies, nickels, dimes and quarters. This changer can handle, quickly and efficiently, all odd cents sales and may be easily converted, on the spot, from 5c sales to 6c, 7c, 10c, 11c, 12c, etc.

Another feature of the "4-in-1" is the instant plug-in, interchangeable with all other National electrical coin control units. This means that National users do not have to throw away valuable equipment . . . the new changer is readily adaptable. The "4-in-1" Changer also includes the automatic return of coins if penny is not inserted first, and a new "4-in-1" Slug Rejector as a part of the changer.

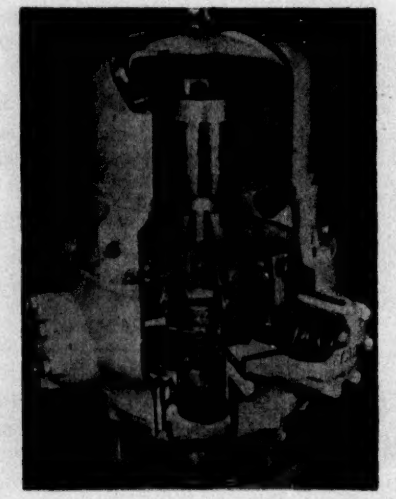
The new mechanism is available from vendor manufacturers or from National's Service Centers located in New York, Chicago, Los Angeles, Atlanta, Dallas, and St. Louis.



Cutaway view of new coin changer introduced by National Rejectors.

Trane Introduces New Hermetic Compressor

ENGINEERS and contractors visiting the 11th International Air Conditioning Exposition previewed an advanced type of hermetic refrigeration machine designed to give quiet, efficient and maintenance-free performance in small home, store and office air conditioners. Already tested in laboratory and field, the new hermetic compressor will be placed in full production later this year by The Trane Company, La Crosse, Wis., one of the nation's largest manufacturers of air conditioning, heating and ventilating equipment.



Cutaway view of new Trane Hermetic Compressor.

The new Trane Accessible Hermetic Compressor will be built in 5 and 7½ ton rate capacities using Freon-22 refrigerant and 3 ton capacity using Freon-12 according to present schedules. It is designed especially for self-contained air conditioning units in homes, stores, offices, restaurants and similar commercial applications.

The design combines the advantages of hermetic construction with accessibility of valves, strainer and lubricants. Aluminum pistons and connecting rods contribute to the quiet, vibration-free operation of the unit. The cast iron crankshaft is statically and dynamically balanced. All parts of all models except motor and crankshaft are interchangeable.

New Line of Turbine Pumps

A LINE of Apco V-type close-coupled turbine-type pumps with mechanical seals in capacities of 3 to 30 gpm, and heads from 0 to 250 feet has been designed by the Aurora Pump Co. They are available with self priming features where desired.

New Turbine Pump made by Aurora Pump Co.

The maker points out that the close-coupled design reduces the pump-motor assembly to small over-all size. Because pump and motor shaft are integral, coupling noise and misalignment troubles are avoided. Four different positions for suction and discharge connections make for installation flexibility. The pump itself is simple; the cover, inner ring and impeller are the only wearing parts and are made of bronze to assure maximum resistance against corrosion. These pumps have a high suction lift, 28 feet (at sea level)—reduced capacities beyond 22 feet. Because Apco pumps handle vapor entrapped in liquid without losing prime, they will not vapor bind.

New Plastic Foam For Insulation

AN illustrated, eight-page booklet describing Colfoam, the new plastic foam for insulation, has been issued by the Colton Chemical Company, Cleveland, Ohio. This booklet explains the application of Colfoam as a low temperature insulation with a K factor of 0.18 at a mean temperature of 75 F., and weighs .8 lb. per cubic foot. Some of the practical applications for Colfoam suggested in the booklet include commercial and household freezers and refrigerators, frozen food shipping containers and refrigeration insulation for trucks, railroad cars and airplanes.

Lilly ICIZER Model 14CE8
Capacity: 12-15 tons per hr.
Other Models for
Large and Small Plants

more profits this summer with a LILLY ICIZER

Sized ice is your biggest money maker . . . and a Lilly Ice Sizing unit is your best bet for easier, more economical, trouble-free, sanitary production. Lilly Icizers offer superior advantages throughout, with—

- Low feed Breaker—easier feeding
- Bucket type elevator—no scraping or grinding of ice
- Rubber wheel sanitary screen drive
- Positive Feed spiral screens
- Bag height Bins—faster filling

—and there's a standard model Lilly Ice Sizer for every size plant.

Boost your profits this summer. Write today for Lilly Catalog No. 303 and get full details on Lilly Sizing and crushing equipment. *No obligation.*

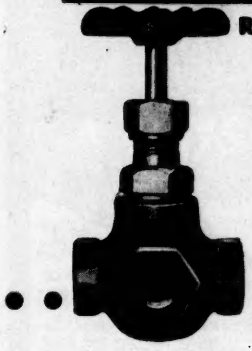
Package Your Ice in
LILLY PAPER BAGS
Write for new lower prices

THE LILLY COMPANY
466 Union Avenue Memphis 1, Tenn.

SUPPLIES - EQUIPMENT
- Bags - Tongs
- Ice Sizers
- Tank Supplies
- Crushers

A complete line of Supplies and equipment for the Ice Industry.

shank AMMONIA VALVES AND REFRIGERATION PRODUCTS



SEMI-STEEL SHUT-OFF VALVE

Highest grade non-porous metal—full size ports—clean cut threads. Back seated stem — Shank design base—perfect alignment. Long life packing ring.

ALL-STEEL GAUGE SETS

All-Steel Construction. Automatic shut-off of liquid in case of glass breakage. Composition packing rings give long life, no-leak seal.

If your jobber doesn't stock—write

CYRUS SHANK CO.
629 W. Jackson Blvd. Chicago 6, Ill.

MUNICIPAL ABATTOIR
Austin, Texas

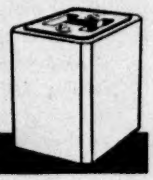
Changes to New STERLING KOOLER KUBES*

"Kooler Kubes solved our problem of clogged brine spray nozzles . . . and since Kooler Kubes are specially heavily compressed . . . they dissolve evenly to keep brine at a uniform salometer reading. And with Kooler Kubes we don't have to add salt as frequently . . . we now use much less salt."

ELDRED PERRY, *Supt.*
Municipal Abattoir
Austin, Texas

Kooler Kubes are special, heavily compressed 50-lb. refrigeration salt cubes for unit coolers, brine spray cold diffusers, and spray deck systems.

*Trademark International Salt Company, Inc.



For Detailed Information Send Coupon Now

INTERNATIONAL SALT COMPANY, INC.
Scranton 2, Pennsylvania

☐ Please have a representative call.

☐ Please send additional information.

Signed:

Name_____

Company_____

Address_____

City_____ Zone____ State____

Wrap-Around Pipe Insulation

A NEW wrap-around pipe insulation, adaptable to hot and cold pipes of all sizes, has been added to the list of Fiberglas products manufactured by Owens-Corning Fiberglas Corporation, Toledo, O.

Known as Aerowrap, the new product is flexible and easy to apply on flanges, fittings and valves, as well as to hot and cold pipes of all sizes. It is a fine fibered insulating blanket with a special binder for use in industrial applications. It is soft and resilient.

Aerowrap is available in 100-foot rolls, 36 inches wide and three-fourths of an inch thick. Pieces from the same roll may be used on different sizes of pipe for any thickness of insulation required and also on fittings. The insulation may be cut easily with sheers, knife or paper cutter. It may be used on pipes with temperatures ranging from sub zero to 600 F and may be applied in various degrees of thickness without difficulty by repeated wrapping.

After being wrapped around pipes the insulation may be kept in place by three different methods; with staples, with adhesive, or with Fiberglas cord tied on six-inch centers. Then any one of four different kinds of jackets may be installed over the insulation. These jackets are made of black roofing felt, white asbestos paper-faced felt, corrugated aluminum sheet or rolled galvanized sheet metal. Jackets may be held in place by wires, hands, staples or screws, depending upon the type selected.

Only special precaution necessary for use of Aerowrap insulation on cold pipe lines is the use of vapor-barriers to prevent condensation on cold pipe surfaces. Without a vapor barrier, moisture will penetrate insulation and condense on the pipe.

The vapor barrier is applied over the Aerowrap and, for indoor lines that are not subjected to abuse, provides a sufficient jacket. However, outdoor lines or indoor lines where additional protection is needed may be finished by using any one of the four jackets recommended for hot lines. The manufacturers claim for it a heat savings efficiency, less installation costs, and that compression packaging provides a reduction in storage space required by others.

A new wrap-around pipe insulation, adaptable to hot or cold pipes of all sizes, introduced by Owens-Corning Fiberglas Corporation, Toledo, O. A soft, resilient blanket, the new product may be wrapped around pipes easily to any desired thickness as shown in the above picture. Known as Aerowrap, the new insulation is a broad step from the conventional practice of insulating hot or cold pipes with rigid materials. Fiberglas engineers say it reduces installation costs, provides a high heat savings efficiency and cuts storage space requirements by 75 per cent.

BETTER SERVICE-BIGGER PROFITS

TRI-PAK *Crusher-Slingers*

A CHOICE OF FIVE MODELS TO FIT YOUR PARTICULAR OPERATION .....

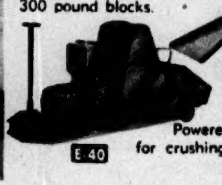
There is a Tri-Pak ice crusher-slinger for every icing need. Whether you ice fishing boats, top ice carloads of vegetables, or re-ice refrigerator trucks, one of Tri-Pak's five sturdy, dependable units is size-rated for your job. All Tri-Pak crusher-slingers save labor by taking full-sized 300 pound blocks of ice. You can depend on these well engineered, sturdily built icing units.

The "Mobil-Icer" is here icing a carload of carrots at the rate of 5 tons every 7 minutes. The trailer mounted "Mobil-Icer" is ideal for team track icing as it can be towed by the truck carrying the ice. The unit is powered by an 8-cylinder Ford industrial engine. Capacity is 55 tons per hour.

The M-337, known as "Mobil-Icer," is ideal for team track icing with a capacity of 55 tons per hour. Powered by an 8-cylinder Ford industrial engine.

The model G-100 rolls easily on 3 rubber-tired, ball bearinged wheels. Powered by an 8 cylinder Ford industrial engine. Capacity 55 tons per hour.

The G-35 crusher-slinger is for icing operations where its capacity of 750 pounds per minute is adequate. Takes full 300 pound blocks.



The E-40 combines high capacity with the quietness and dependability of the electric motor. Capacity 55 tons per hour. Powered by a 10 HP electric motor for crushing, 30 HP motor for slinging.

The E-13 has a capacity of 600 pounds per minute. Uses one 3 HP and one 10 HP electric motor.

TRI-PAK MACHINERY SERVICE, Inc. ★ HARLINGEN TEXAS

YOUR CATALOG

TRI-PAK MACHINERY SERVICE, INC.
HARLINGEN, TEXAS

Please send us your icing equipment catalog.

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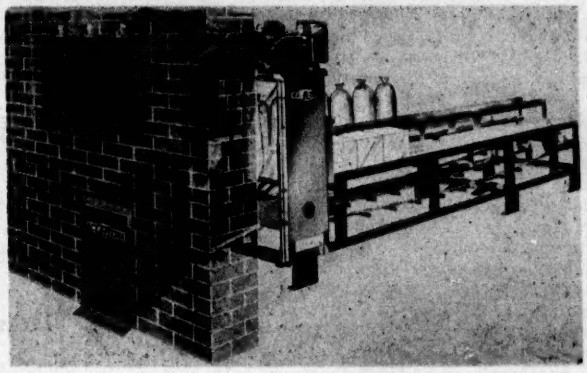
PERFECTION ICE-A-TERIA

MANUFACTURERS OF
PERFECTION MADE MILLER
and
PERFECTION SPECIAL

A LABOR SAVER...

Today, labor costs eat into your profits. The new Perfection Ice-A-Teria, fully automatic vending machine, actually pays for itself from savings on labor. More than that, however, you can offer your customers 24-hour service. The Perfection Ice-A-Teria is adaptable to fill your needs. Write, wire, or phone today for complete information.



QUICK DELIVERY!

Write, Wire or Phone

PERFECTION ICE SCORING MACHINE CO.

P. O. Box 2140 Fort Worth, Texas Phone EDison 1258

ARMSTRONG PURGERS SAVE 4 WAYS

1. Save Power
2. Save Refrigerant
3. Save Work
4. Increase Capacity

CHECK your system for excess head pressure ... Each 4 lbs. excess raises the load on your compressor, reduces its capacity by 1% and increases power costs 2%! Air and other non-condensables collecting in the condenser and receiver are nearly always the cause. An Armstrong Purger rids the system of air and keeps it that way...reduces loss of refrigerant...saves labor and time. The Purger pays for itself in short order.

SEND FOR BULLETIN 192 for complete details and prices.

ARMSTRONG MACHINE WORKS
860 Maple St., Three Rivers, Michigan

The MERIT is "BUILT-IN"

Type GGU

by Aurora

These Type GGU Aurora Side Suction Centrifugal Pumps are employed wherever liquids are used in processing. Discharge may be in any of eight positions. Small amount of special metals required for handling corrosives.

PUMPS *"by Aurora"* are the product of exclusive builders of fine pumps. Try them. You, too, will like them.

DISTRIBUTORS IN PRINCIPAL CITIES

AURORA Always PUMPS

AURORA PUMP COMPANY

78 Loucks Street, Aurora, Illinois

MANUFACTURERS' NEWS

Trane Luncheon—Preview

BUSINESS paper editors of refrigerating and air conditioning publications were entertained at a luncheon and preview of the Trane Company exhibit at the International Air Conditioning Exposition, January 26. Luncheon was served at the Saddle & Sirloin Club adjoining the International Amphitheatre, where the exposition was staged.

Following the luncheon a brief talk was given by D. C. Minard, Trane Company president. Mr. Minard sketched briefly some of the newer equipment being distributed by the company, including the baseboard convector, an advanced type of hermetic refrigeration machine, and a new cold generator. He announced that an important part of the company's promotional efforts this year will be directed toward air conditioning of schools. Regarding propects for 1953 he said present indications are that sales will show a healthy increase over 1953 and that profits also (before Taxes) will show an increase.

Canadian Ice Machine Co. Announces Appointments

THE appointments of R. A. Stencel as vice-president in charge of engineering and A. J. Beverley as chief engineer has been announced by H. V. Shipley, president of Canadian Ice Machine Co., Ltd.

Mr. Stencel has held the position of chief engineer of the company for the past 26 years. He is well known in the refrigeration and air conditioning field in both Canada and the United States. He is a director of the American Society of Refrigerating Engineers; director and past chairman of the Safety Code Committee Canadian Refrigeration Manufacturers Association; member of the Professional Engineers of Ontario and American Society of Heating and Ventilating Engineers.

Mr. Beverley prior to his new association was for many years senior project engineer for the York Corporation. Philadelphia. In that capacity he had a wide experience in refrigeration and air conditioning equipment design, engineering, installation and maintenance. This experience he brings to his new post with Canada's largest refrigeration and air conditioning engineering and contracting organization.

York Corp. Elects Officers

DURING the annual meeting of the board of directors held at York, Pa. January 23, Stewart E. Lauer was re-elected president of York Corporation. Mr. Lauer was first elected president of the air conditioning and refrigeration firm in 1940.

At the same session the following officers were re-elected: John G. Bergdoll, Jr., vice president and general works manager; John R. Hertzler, vice-president and general sales manager; Rodney F. Lauer, vice-president, engineering and research; J. Keith Louden, vice-president and assistant to the president; Donald M. Magor, vice-president and controller; Marshall G. Munce, vice-president, trade relations; and William F. Lynne, secretary and treasurer. Charles A. Barnes was re-appointed assistant secretary and assistant treasurer while Carl W. Fenninger, Jr., was re-named assistant secretary.

At the annual meeting of the stockholders held prior to the meeting of the board of directors, Philip H. Glatfelter, president and treasurer of the P. H. Glatfelter Co.; Elmer A. Kleinschmidt, formerly executive vice-president and now consultant to York Corporation; Stewart S. Lauer, and Richard T. Nalle, president of the Midvale Co., were re-elected directors to serve for three years.

Other directors are: Carl W. Fenninger, director of the Provident Trust Co., Philadelphia; John R. Hertzler, J. Keith Louden, William J. Meinel, president of the Heintz Manufacturing Co.; George S. Munson, partner in the law firm of Townsend, Elliott and Munson; and Robert W. Wolcott, chairman of the board of Lukens Steel Company.

Butcher Boy Door Company Moves to Harvard

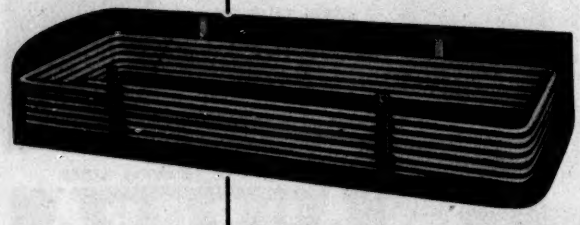
THE BUTCHER Boy Refrigerator Door Company has moved its manufacturing operations to a new plant at Harvard, Ill. The new location includes the company's general offices and manufacturing facilities. Over fifty five thousand square feet of floor space is used for manufacturing facilities alone. Moving of the heavy wood and metal working machinery from the Sangamom St. address in Chicago to Harvard took place during the latter part of December, with production resumed at Harvard immediately after the first of the year.

CATALOGS AND BULLETINS

Butcher Boy Catalog

A NEW catalogue in color, describing an X-Type Door for refrigerators and cold storage rooms, has been issued by the Butcher Boy Refrigerator Door Co. of Harvard, Ill. Catalogue describes the X-Type steel diagonal bracing of the manufacturers doors and the various types available for the many refrigerator applications. The catalogue also lists dealers throughout the United States, North and South America and Japan. Catalogues are available on request from Butcher Boy, or this magazine will forward your inquiries.

Stainless PIPE COIL BENDING



Many customers, equipped to do iron pipe bending in their own plants, hesitate to tackle stainless and turn to CHICAGO NIPPLE for these special coils. They know that we have the equipment and the experience necessary to make coils in stainless to their exact specifications, with welds that are strong and tight.

Send B/P for quotation on your next job.

CHICAGO NIPPLE MFG. CO. *1997 Clybourn Ave.* CHICAGO 14

THE BUYERS DIRECTORY

INDEX TO ADVERTISEMENTS OF THESE FIRMS — PAGE 72

ABSORBERS
Frick Co., Waynesboro, Pa.
Vogt Machine Co., Henry, Louisville, Ky.

AIR COMPRESSORS
Frick Co., Waynesboro, Pa.

AIR CONDITIONING EQUIPMENT
Carrier Corp., Syracuse, N. Y.
Frick Co., Waynesboro, Pa.
Howe Ice Machine Co., Chicago, Ill.
Niagara Blower Co., New York, N. Y.
Vilter Mfg. Co., Milwaukee, Wis.

AMMONIA COMPRESSOR VALVES
Frick Co., Waynesboro, Pa.
Howe Ice Machine Co., Chicago, Ill.
Vilter Mfg. Co., Milwaukee, Wis.

AMMONIA COMPRESSORS
Creamery Package Mfg. Co., Chicago, Ill.
Dersch, Gesswein & Neuert, Inc. Chicago, Ill.
Enterprise Equipment Corp., Yonkers, N. Y.
Frick Co., Waynesboro, Pa.
Reynolds Mfg. Co., Springfield, Mo.
Vilter Mfg. Co., Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.

AMMONIA CONTROL DEVICES
Dersch, Gesswein & Neuert, Inc., Chicago, Ill.

AMMONIA FLOAT VALVES
Acme Industries, Inc., Jackson, Mich.
Armstrong Machine Works, Three Rivers, Mich.
Frick Co., Waynesvoro, Pa.
Phillips & Co. H. A., Chicago. Ill.
Vilter Mfg. Co., Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.

AMMONIA MANUFACTURERS
Armour Ammonia Div., Armour & Co., Chicago, Ill.
Bower Chemical Mfg. Co., Henry Philadelphia, Pa.
du Pont de Nemours & Co., Inc., E. I., Polychemicals Dept., Wilmington, Del.

AMMONIA MASKS
Acme Protection Equipment Co., Chicago, Ill.

AMMONIA PURIFIERS
Dersch, Gesswein & Neuert, Inc., Chicago, Ill.
Frick Co., Waynesboro, Pa.
Howe Ice Machine Co., Chicago, Ill.
International Salt Co., Inc., Scranton, Pa.
Vilter Mfg. Co., Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.

AMMONIA RECEIVERS
Acme Industries, Inc., Jackson, Mich.
Creamery Package Mfg. Co., Chicago, Ill.
Dersch, Gesswein & Neuert, Inc., Chicago, Ill.
Enterprise Equipment Corp., Yonkers, N. Y.
Frick Co., Waynesboro, Pa.
Howe Ice Machine Co., Chicago, Ill.
National Pipe Bending Co., New Haven, Conn.
Reynolds Mfg. Co., Springfield, Mo.
Vilter Mfg. Co., Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.

AMMONIA VALVES & FITTINGS
Dersch, Gesswein & Neuert, Inc. Chicago, Ill.
Shank Co., Cyrus, Chicago, Ill.
Vilter Mfg. Co., Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.

ARCHITECTS AND ENGINEERS
Greene, Van R. H., New York, N. Y.
Ophuls & Associates, Fred, New York, N. Y.

ASPHALT PRODUCTS
American Bitumuls & Asphalt Co. San Francisco, Calif.

AUTOMATIC CONTROL DEVICES
Alco Valve Co., St. Louis, Mo.
Armstrong Machine Works, Three Rivers, Mich.
Frick Co., Waynesboro, Pa.
Phillips & Co., H. A., Chicago, Ill.
Rex Engineering & Sales Co., Oklahoma City, Okla.
Vilter Mfg. Co., Milwaukee, Wis.

BAGS, ICE
Daniels, Inc., C. R., Baltimore, Md.
Index Coupon & Supply Co., La Porte, Ind.
Union Bag & Paper Corp., New York, N. Y.

BAGS, WATERPROOF PAPER
Index Coupon & Supply Co., La Porte, Ind.
Union Bag & Paper Co., New York, N. Y.

BEER COOLERS
Frick Co., Waynesboro, Pa.
Martocello & Co., Jos. A., Philadelphia, Penna.
Vilter Mfg. Co., Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.

BLOWERS
Frick Co., Waynesboro, Pa.
Roots-Connersville Blower Corp., Connersville, Ind.

BOILERS
Frick Co., Waynesboro, Pa.
Vogt Machine Co., Henry, Louisville, Ky.

BOILER TUBES
Byers Co., A. M., Pittsburgh, Pa.

BOOKS—TECHNICAL
Nickerson & Collins Co., Chicago, Ill.

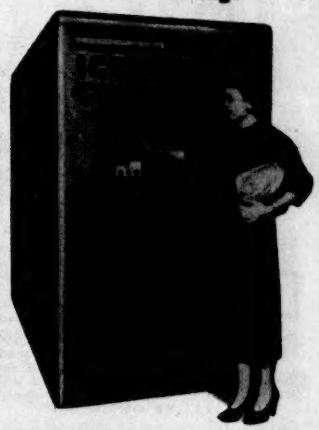
BRINE CIRCULATORS
Creamery Package Mfg. Co., Chicago, Ill.
Frick Co., Waynesboro, Pa.
Reynolds Mfg. Co., Springfield, Mo.
Roots-Connersville Blower Corp., Connersville, Ky.
Vilter Mfg. Co., Milwaukee, Wis.

BRINE COOLERS
Acme Industries, Inc., Jackson, Mich.
Dersch, Gesswein & Neuert, Inc., Chicago, Ill.
Enterprise Equipment Corp., Yonkers, N. Y.
Frick Co., Waynesboro, Pa.
Kehoe Machinery Co., Inc., R. P., West Englewood, N. J.
Reynolds Mfg. Co., Springfield, Mo
Vilter Mfg. Co., Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.

The **POLAR** *Aluminum* Ice Vending Station
Sells Cubed or Crushed Ice

BELT CAPACITY 40 Ten-pound Bags

STORAGE 200 Ten-pound Bags



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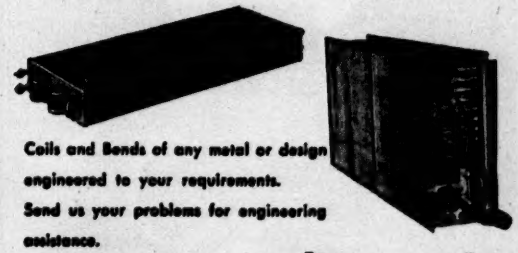

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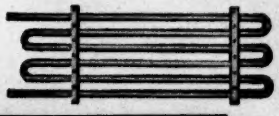

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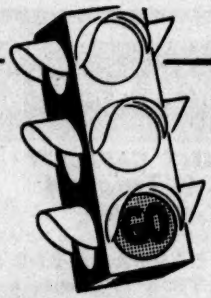
845 N. Sacramento Blvd., Chicago 12, Ill.



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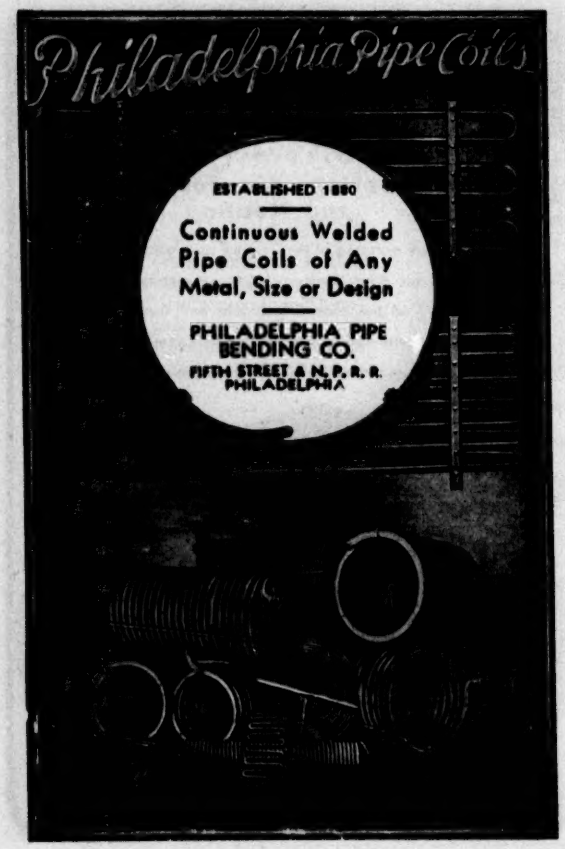
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Acme Industries, Inc., Jackson, Mich.
Frick Co., Waynesboro, Pa.

BRINE TREATMENT
International Salt Co., Inc., Scranton, Pa.

CALCIUM CHLORIDE
Solvay Process Div., The Allied Chemical & Dye Corp., New York, N. Y.

CAN DUMPS
Frick Co., Waynesboro, Pa.
Gifford-Wood Co., Hudson, N. Y.
Ohio Galvanizing & Mfg. Co., Niles, Ohio
Reynolds Mfg. Co., Springfield, Mo.
Vilter Mfg. Co., Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.

CANVAS COVERS
Daniels, Inc., C. R., Baltimore, Md.

CAR ICING EQUIPMENT
Gifford-Wood Co., Hudson, N. Y.
Lilly Co., The, Memphis, Tenn.
Tri-Pak Machinery Service Inc., Harlingen, Tex.

COILS
Acme Industries, Inc., Jackson, Mich.
Byers Co., A. M., Pittsburgh, Pa.
Chicago Nipple Mfg. Co., Chicago, Ill.
Creamery Package Mfg. Co., Chicago, Ill.
Detroit Ice Machine Co., Detroit, Mich.
Howe Ice Machine Co., Chicago, Ill.
National Pipe Bending Co., New Haven, Conn.
Vilter Mfg. Co., Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.

COLD STORAGE CONSTRUCTION
Armstrong Cork Co., Lancaster, Pa.
Frick Co., Waynesboro, Pa.

COLD STORAGE DOORS
Butcher Boy Refrigerator Door Co., Harvard, Ill.
Jamison Cold Stge. Door Co., Hagerstown, Md.
Refrigeration Engineering Co., Montgomery, Minn.

COMPRESSORS
(See Ice Making and Refrigerating Machinery)

COMPRESSOR VALVE PLATES AND DISCS
Voss, Inc., J. H. H. New York, N.Y.

COMPRESSOR VALVES
Voss, Inc., J. H. H., New York, N.Y.

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Enterprise Equipment Corp., Yonkers, N. Y.
Dersch, Gesswein & Neuert, Inc., Chicago, Ill.
Frick Co., Waynesboro, Pa.
Howe Ice Machine Co., Chicago, Ill.
King-Zeero Co., Chicago, Ill.
National Pipe Bending Co., New Haven, Conn.
Reynolds Mfg. Co., Springfield, Mo.
Vilter Mfg. Co., Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.

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Ophuls & Associates, Fred, New York, N. Y.

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Lilly Co., The, Memphis, Tenn.

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Vilter Mfg. Co., Milwaukee, Wis.

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Armstrong Cork Co., Lancaster, Pa.

CORROSION CONTROL
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MMM, Inc., Houston, Texas

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Caterpillar Tractor Co., Peoria, Ill.

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Vilter Mfg. Co., Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.

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Lewis-Shepard Products, Inc., Watertown, Mass.
Lilly Co., The, Memphis, Tenn.

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(See Architects and Engineers)

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EVAPORATIVE CONDENSERS
Niagara Blower Co., New York, N. Y.

EVAPORATORS
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Creamery Package Mfg. Co., Chicago, Ill.
Frick Co., Waynesboro, Pa.
Niagara Blower Co., New York, N. Y.
Vilter Mfg. Co., Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.

FEED-WATER HEATERS
National Pipe Bending Co., New Haven, Conn.
Vogt Machine Co., Henry, Louisville, Ky.

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FIBERGLAS
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FIELD ICE SAWS
Gifford-Wood Co., Hudson, N. Y.

FILTERS, WATER
Frick Co., Waynesboro, Pa.

FIN COILS
Acme Industries, Inc., Jackson, Mich.
Howe Ice Machine Co., Chicago, Ill.
Vilter Mfg. Co., Milwaukee, Wis.

FIRST AID SUPPLIES
Acme Protection Equipment Co., Chicago, Ill.

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Dersch, Gesswein & Neuert, Inc., Chicago, Ill.
Frick Co., Waynesboro, Pa.
Henry Valve Co., Chicago, Ill.
Vilter Mfg. Co., Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.

FLOAT VALVES
Mojonnier Bros. Co., Chicago, Ill.

FLOOR PATCHING
Permamix Corp., Chicago, Ill.

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Howe Ice Machine Co., Chicago, Ill.

FROZEN FOOD LOCKERS
Knickerbocker Stamping Co., Parkersburg, W. Va.

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HYGROMETERS
Taylor Instrument Cos., Rochester, N. Y.

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Union Bag & Paper Corp., New York, N. Y.

ICE BLOWERS
Gifford-Wood Co., Hudson, N. Y.

ICE CANS
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Ohio Galvanizing & Mfg. Co., Niles, Ohio

ICE CAN FILLERS
Frick Co., Waynesboro, Pa.
Knickerbocker Stamping Co., Parkersburg, W. Va.
Ohio Galvanizing & Mfg. Co., Niles, Ohio
Vilter Mfg. Co., Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.

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Vivian Mfg. Co., St. Louis, Mo.

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Gifford-Wood Co., Hudson, N. Y.
Index Coupon & Supply Co., La Porte, Ind.
Lilly Co., The, Memphis, Tenn.
Micron, Inc., Bettendorf, Iowa
Tri-Pak Machinery Service Inc., Harlingen, Tex.
Vivian Mfg. Co., St. Louis, Mo.

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Lilly Co., The, Memphis, Tenn.
Union Bag & Paper Co., New York, N. Y.
Vivian Mfg. Co., St. Louis, Mo.

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Vivian Mfg. Co., St. Louis, Mo.

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Lilly Co., The, Memphis, Tenn.

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Daniels, Inc., C. R., Baltimore, Md.
Gifford-Wood Co., Hudson, N. Y.
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Lilly Co., The, Memphis, Tenn.
Union Bag & Paper Corp., New York, N. Y.
Vivian Mfg. Co., St. Louis, Mo.

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Creamery Package Mfg. Co., Chicago, Ill.
Dersch, Gesswein & Neuert, Inc., Chicago, Ill.
Detroit Ice Machine Co., Detroit, Mich.
Enterprise Equipment Corp., Yonkers, N. Y.
Frick Company, Waynesboro, Pa.
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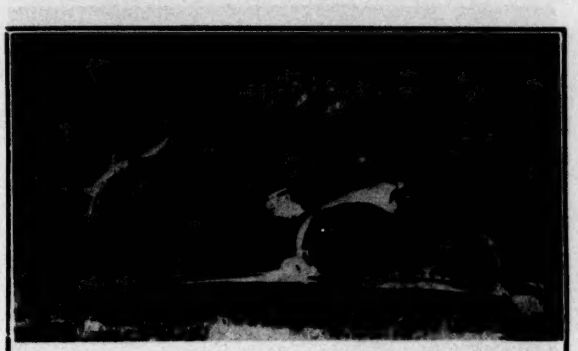

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Gifford-Wood Co., Hudson, N. Y.
Index Coupon & Supply Co., La Porte, Ind.
Lilly Co., The, Memphis, Tenn.
Vivian Mfg. Co., St. Louis, Mo.

ICE PICK SCABBARDS
Gifford-Wood Co., Hudson, N. Y.
Index Coupon & Supply Co., La Porte, Ind.
Lilly Co., The, Memphis, Tenn.
Vivian Mfg. Co., St. Louis, Mo.

ICE PLANTS
Enterprise Equipment Corp., Yonkers, N. Y.

ICE SCALES
Conveyor Co., The, Los Angeles, Calif.
Gifford-Wood Co., Hudson, N. Y.
Index Coupon & Supply Co., La Porte, Ind.
Lilly Co., The, Memphis, Tenn.
Vivian Mfg. Co., St. Louis, Mo.

ICE TOOLS
Gifford-Wood Co., Hudson, N. Y.
Ice Plant Equipment Co., Inc., Philadelphia, Pa.
Index Coupon & Supply Co., La Porte, Ind.
Lilly Co., The, Memphis, Tenn.

ICE VENDING KITS
Refrigeration Engineering Co., Montgomery, Minn.

ICE VENDORS
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Jamison Cold Storage Door Co., Hagerstown, Md.
Refrigeration Engineering Co., Montgomery, Minn.
S & S Vending Machine Co., San Jose, Calif.
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Pacific Lumber Co., San Francisco, Calif.

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LOW TEMPERATURE EQUIPMENT
(See Ice Making and Refrigerating Machinery)

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Mojonnier Bros. Co., Chicago, Ill.

MASKS, AMMONIA
Acme Protection Equipment Co., Chicago, Ill.

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Texas Co., The, New York, N. Y.

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Rex Engineering & Sales Co., Oklahoma City, Okla.
Vilter Mfg. Co., Milwaukee, Wis.

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Texas Co., The, New York, N. Y.

OILS, FUEL
Sun Oil Co., Philadelphia, Pa.
Texas Co., The, New York, N. Y.

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Vivian Mfg. Co., St. Louis, Mo.

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Chicago Nipple Mfg. Co., Chicago, Ill.
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National Pipe Bending Co., New Haven, Conn.
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Vogt Machine Co., Henry, Louisville, Ky.

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Vogt Machine Co., Henry, Louisville, Ky.

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Vilter Mfg. Co., Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.

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PRESSURE REGULATORS
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Vilter Mfg. Co., Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.

DIRECTORY

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PUMPS, DEEP WELL
Aurora Pump Co., Aurora, Ill.
Layne & Bowler, Inc., Memphis, Tenn.

PUMPS, ROTARY
Aurora Pump Company, Aurora, Ill.
Roots-Connersville Blower Corp., Connersville, Ind.

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Frick Company, Waynesboro, Pa.
Rex Engineering & Sales Co., Oklahoma City, Okla.

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Frick Co., Waynesboro, Pa.
Vogt Machine Co., Henry, Louisville, Ky.

REBOILERS
Frick Company, Waynesboro, Pa.
Vogt Machine Co., Henry, Louisville, Ky.

RECORDING THERMOMETERS
Taylor Instrument Cos., Rochester, N. Y.

REFRIGERATED ICE STATIONS
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REFRIGERATING AND ICE MAKING MACHINERY
(See Ice Making and Refrigerating Machinery)

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Gifford-Wood Co., Hudson, N. Y.
Lilly Co., The, Memphis, Tenn.
Perfection Ice Scoring Machine Co., Fort Worth, Texas

SECOND HAND MACHINERY
Enterprise Equipment Corp., Yonkers, N. Y.

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King-Zeero Co., Chicago, Ill.
National Pipe Bending Co., New Haven, Conn.
Vilter Mfg. Co., Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.

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Lilly Co., The, Memphis, Tenn.
Vivian Mfg. Co., St. Louis, Mo.

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Lilly Co., The, Memphis, Tenn.
Vivian Mfg. Co., St. Louis, Mo.

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National Pipe Bending Co., New Haven, Conn.

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Vogt Machine Co., Henry, Louisville, Ky.

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Lilly Co., The, Memphis, Tenn.
Vivian Mfg. Co., St. Louis, Mo.

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Vogt Machine Co., Henry, Louisville, Ky.

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Wright Chemical Corp., Chicago, Ill.

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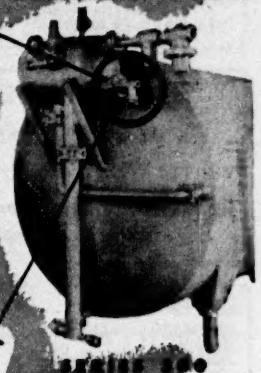

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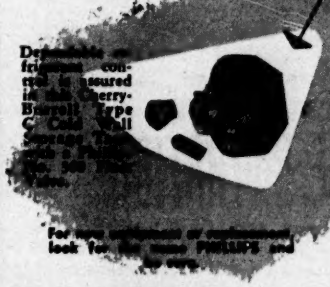

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Classified Advertising

All classified advertisements are payable in advance. Except for Positions and Help Wanted classifications, this section is reserved exclusively for USED equipment.

RATES: $4.00 for 50 words or less; 70c for each additional 10 words or fraction thereof; $1 per line for bold face headings; $10.00 per inch for line listings.

ICE PLANTS—for sale

FOR SALE—Just shut down complete 10 ton York ice plant. Can be operated in present location or dismantled. To be sold before April 1st. Will consider any reasonable offer. Springfield Ice Company, River Road, Springfield, Vermont. Phone 4411.

FOR SALE—or lease, to responsible party, on attractive basis. 50 ton ice plant which is the only plant in this county of 37,000 population, with no competition. Selling due to death of manager and head of company. Write A. B. Stowers, Harriman, Tenn.

FOR SALE—by owner. Brand new (used 39 mos.) 140 ton electric York high pressure one man ice plant, to be moved; 28 can pull. This is the opportunity of a lifetime. Details cheerfully furnished. Address Box 33, Baltimore 13, Md.

ICE PLANT FOR SALE

To close an estate: in rapidly expanding industrialized area, between Toronto and Hamilton, Canada. New equipment with thirty ton capacity plus 1,000 ton storage. Off-season revenue from refrigeration of Arena next door. Arena also for sale cheap. Write or wire C. W. Leask, Executor, 19 Melinda St., Toronto, Canada.

FOR SALE—Complete ice plant consisting of Superior Diesel with generator operating 10x10 ice machine, lids, cans, hoist, scoring machine, water treatment equipment with tank, also 25T shell and tube, cooler complete with agitator and accumulator. All A-1 condition. Home City Ice Co., Ivanhoe Ave., Cincinnati 33, Ohio.

FOR SALE—Ill health forces sale of modern 50 ton electric driven ice plant with new modern harvesting, cubing and sizing equipment. Has modern deionizing water treating system for top quality ice. All in excellent condition. Output in the immediate area 8,000 to 10,000 tons. Over 3500 sq. ft. storage adaptable to food freezing. Centrally located in over million population. Close to vegetable and fruit loadings. Will sacrifice this plant, on very desirable highway property, for real estate value for quick sale. $75,000 or will dismantle for removal for $15,000. Will lease to responsible party. Delno Ice Plant, 620 El Camino Real, Menlo Park, Calif.

COLD STORAGE BUSINESS—Are you interested in going into the cold storage business in one of the fastest growing cities in Texas? Or, if you are in the cold storage business do you wish to expand? We have a large insulated building that can be converted into a million and a half cubic feet of storage space, located on a main highway accessible for trucks and railroad siding. Shortage of storage space in this area. Can be converted over and investment will pay out in 2½ years. If interested contact O. T. Clark, 1500 Electric Building, Fort Worth, Texas, for details.

USED EQUIPMENT-wanted & for sale

FOR SALE—one 252 can, 300 lb. York ice tank with agitator, dump and filler, 2 can electric hoist, water filter, air blower and air compressor. Practically new. Meadow Gold Products Co., 1337 D St. S.E., Washington 3, D. C.

FOR SALE — NEW ICE BOXES

2—100-lb. Olympics; 1—75-lb. Progress; 1—75-lb. Vitalaire. 2 good used boxes. All for $150.00. Write Mr. Jack Bennett, The Bennett Creamery Co., Ottawa, Kansas.

FOR SALE—Small ammonia compressors, self-contained units, 6x6 and 9x9. 7½x7½, 9x9 and 12x12 with synchronous motors; ice cans, condensers, brine coolers, agitators, blowers, motors, complete plants. Parke Pettegrew & Son Company, 370 W. Broad St., Columbus 8, Ohio.

USED EQUIPMENT—continued

FOR SALE—Frick 8x8 compressor No. 20990, receiver 20" x 10' with valves and gauge, Hill Non Condensable gas separator No. 251, F & E cuber type 300S; new, 1947, used 3 years, Crystal Ice & Storage Co., 2215 Delaware Ave., Buffalo, N. Y.

FOR SALE—8000' 1¼" ammonia pipe coils. Excellent condition; used in hardening room. G. E. Griffin, P.O. Box 1163, Knoxville, Tenn.

WANTED—1 New 200 lb. 3 door domestic ice refrigerator. Please give make, description, price and location. Eupora Ice Co., Eupora, Miss.

FOR SALE—Two 8x8 Yorks with 30 h.p. motors. 3x3 and 5x5 self-contained Yorks. 5x5, 6x6, 8x8, 9x9 Yorks splash lubrication. One 3 ton York floor type blower unit. One 2 ton Niagara suspended type blower unit. Receivers, all sizes. Ammonia valves, 30% off. Write E. Niebling, 1546 St. Clair Ave., Mt. Healthy, Cincinnati 31, Ohio.

FOR SALE—1 Vilter 9½ x 9½ horizontal ammonia compressor complete with V belt drive, starter motor; excellent condition, very reasonable. If you want a good compressor, here it is. South Haven Fruit Exchange, South Haven, Mich.

FOR SALE

2 each Compressor, Ammonia, Frick, double action, 10½" x 18" J. T., 140 tons cap., 22 lbs. PSI suction, 185 lbs. PSI discharge, directly connected to electric motor w/GE Syncronous type QS-40-180M-180 form EJ, 39.1 amp., power factor 1.0, amp. field 38.3 w/electric control panel, GE, type AQ2Y, 2300 volt, 225 KVA w/motor Generator set including: 1 GE induction motor, AC, type KQ944-4-7½—1800, form C, 2 phase, 60 cycle, 220 volt, 7½ HP; 1 GE DC Generator, type CD65, Form A, compound wound, 46 amp., 125/125 volt 1800 RPM, 5—¾ KW, w/starting compensator, manual reset, GE, CR 1034-K1, Cat. #201901303-12F6 motor HP 5—15, 220 volt, 60 cycle, 2 phase, w/condenser, vertical type, gravity feed, Frick, 38", dia. x 14' long. 140-2" tubes w/6" gaseous inlet, 3" liquid outlet w/49" x 49"—1" steel plate base, Ser. Nos. 29683 RT-29683½ LT, 29682 RT-29682½ LT.

2 each Water Cooler, Vilter, shell & tube 12 pass, 24" dia. x 12' olng, 156—1¼" tubes—612 sq. ft. of surface, equipped W/12" x 10'8" suction accumulator, header, & one A60242F #1211 style E ammonia L. P. Folat valve. w/1-4" ammonia stop valve & 1 1—1¼" drain valve w/pipe S type stand for vertical mounting.

5 each Packice Machine, Vilter, 6—section, spray type, complete w/horizontal accumulators w/style #E float valve, less float body. Complete w/connections and piping w/motor reducer—5 HP Louis-Allis motor, type OGS, frame 754, Class N, Form B, 1750 RPM, 220/440 volt, 3 phase, 60 cycle, 13/6.5 amp., w/flex, spring coupling for connecting motor reducer to freezer shaft; w/Briquette press for making #1-16 briquetts complete w/chain drive, 1¼" pitch DBL width roller chain w/sprockets for briquettes and motor shaft, w/press motor-reducers, 13.5 RPM, output speed; w/3 HP, Ideal Electric Motor, induction, Class A, Frame 255, 1700 RPM, 224/440 volts, 3 phase, 60 cycle, 7.6 amp; w/pump, Weinan 2" type U & B, motor driven, 90 gal. per M., 30' head, 1750 RPM, 1 phase, w/Louis-Allis Electric Motor, splash proof, type FX, frame 224, Class R, Form A, 2 HP, 220/440 volt, 1750 RPM, 3 phase, 60 cycle, 5.6/2.8 amp., Code H, Ser. #49352.
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Phone—County 5300

FOR SALE
USED ICE PLANTS AND REFRIGERATING EQUIPMENT
Complete ice plants—10-50 ton.
Ammonia compressors—all sizes.
Condensers, brine coolers, ice cans.
Valves and fittings.
B & E REFRIGERATING CO.
2 ORANGE ST., NEWARK 2, N. J.
Phone: MItchell 3-7790 Cable address "BERECO"

WANTED—one 10x10, 9x9 or 8x8 high speed ammonia compressor, York or Frick, with or without motor. Motor must be 2300 volts, 60 cycle, 3 phase. Also one extra flywheel for 10x10 compressor. Beard Ice Co., 46-48 College St., Danville, Ill.

FOR SALE—Late model IBM time clock, used 2 years, $50.00. Worthington Monoblock Pump, 1½"—1 h.p., A.C. 60 cy., 110-220v, 3450 r.p.m., used 2 years, $100.00. 24 brand new Ohio Galvanizing Co. ice cans, 11x22x49, $4.00 each. Charlotte Ice Co., Charlotte, Mich.

FOR SALE—COMPLETE ICE MAKING PLANTS

60 ton—14 can pull; 35 ton, Diesel drive—6 can pull; 25 ton, 5 can pull.

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1—12½x14½ York, ⅓ & ⅔ capacity control.
2—10x10 Yorks, 4100 volt, 300 r.p.m. motors.
2—6½x6½ Yorks high speed.
1—6x6 York high speed.
1—4x4 York self-contained unit.

MISCELLANEOUS EQUIPMENT

130 h.p. 3 cylinder Superior Diesel engine, 600 r.p.m.
75 h.p. motor. 730 r.p.m.—30 h.p. motor, 860 r.p.m.
15 h.p. water pump, 7½ & 10 h.p. centrifugal blowers, scoring machines, ice cans, agitators, etc.

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"A" & Venango Sts. Philadelphia 34, Pa.
Phone Garfield 6-2221

FOR SALE—Frick Sharp Freezer. Installed in 1946. Sharp freezing capacity approximately 1000 lbs. per hour. Can construct large room and use as a storage and/or sharp freezer. Can be installed as a tunnel, individual truck, or shelf type unit. Palco wool insulation and automatic float valves goes with unit. Equipment is located at our plant in Lebanon, Pa. Write or phone 2-4687, Chas. T. Corkran, 9th & Water Sts., Lebanon, Pa.

FOR SALE—One Gifford-Wood automatic ice cubing machine. Takes 300 lb. ice cake. Used very little and in excellent condition. One No. 50 Flynn & Emrich ice cuber. Shows very little use and in good condition. The Hill Manufacturing Co., 380 Lexington Ave., New York 17, N. Y.

FOR SALE — USED ICE PLANTS AND REFRIGERATING EQUIPMENT

2—90 ton York Evaporative Condensers
20 ton Ice Plant, 252 300-lb. Cans, Diesel drive compressor
30 ton Ice Plant, 368 300-lb. Cans, 8 can pull, Electric driven
40 ton Ice Plant, 552 300-lb. Cans, 6 can pull, Diesel driven
130 ton Ice Plant, 1,378 300-lb. Cans, 26 can pull, Electric driven
175 ton Ice Plant, 2 tanks, 969 cans each tank, 1,938 total, 19 can pull, Electric driven
10,000 11" x 22" x 47" 300-lb. Ice Cans, Excellent Condition
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Ammonia Compressors 3" x 3" to 12½" x 14½"
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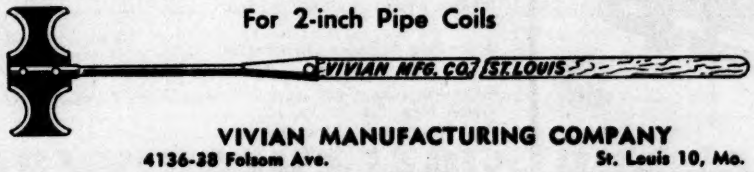
Yonkers 8-8118-9 Cable Address: ENEQCO

POSITIONS AND HELP WANTED

WANTED—Operating refrigeration engineer capable of taking charge of 100 ton ice plant. Steady employment. Located in Western New York state. State experience and qualifications in reply. Address Box MR-16, Ice and Refrigeration, 435 N. Waller Ave., Chicago 44.



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REFRIGERATION COILS

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Long since, *NATIONAL Refrigeration Coils* became standard in the industry, and today a third generation of users is specifying NATIONAL for smoothness of bend, perfection of welding, and accuracy of measurement.

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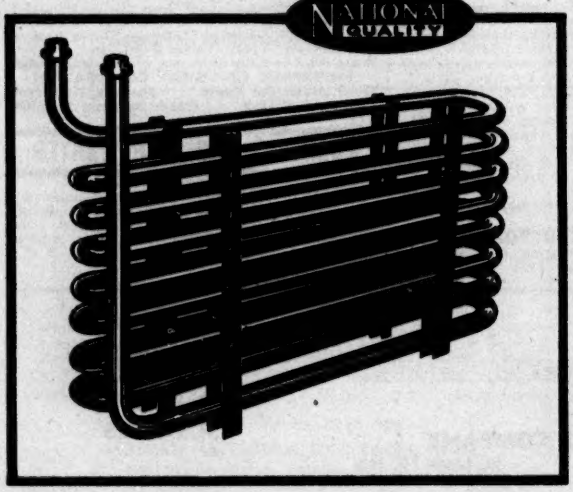
162 RIVER STREET • NEW HAVEN, CONN.

Established 1883



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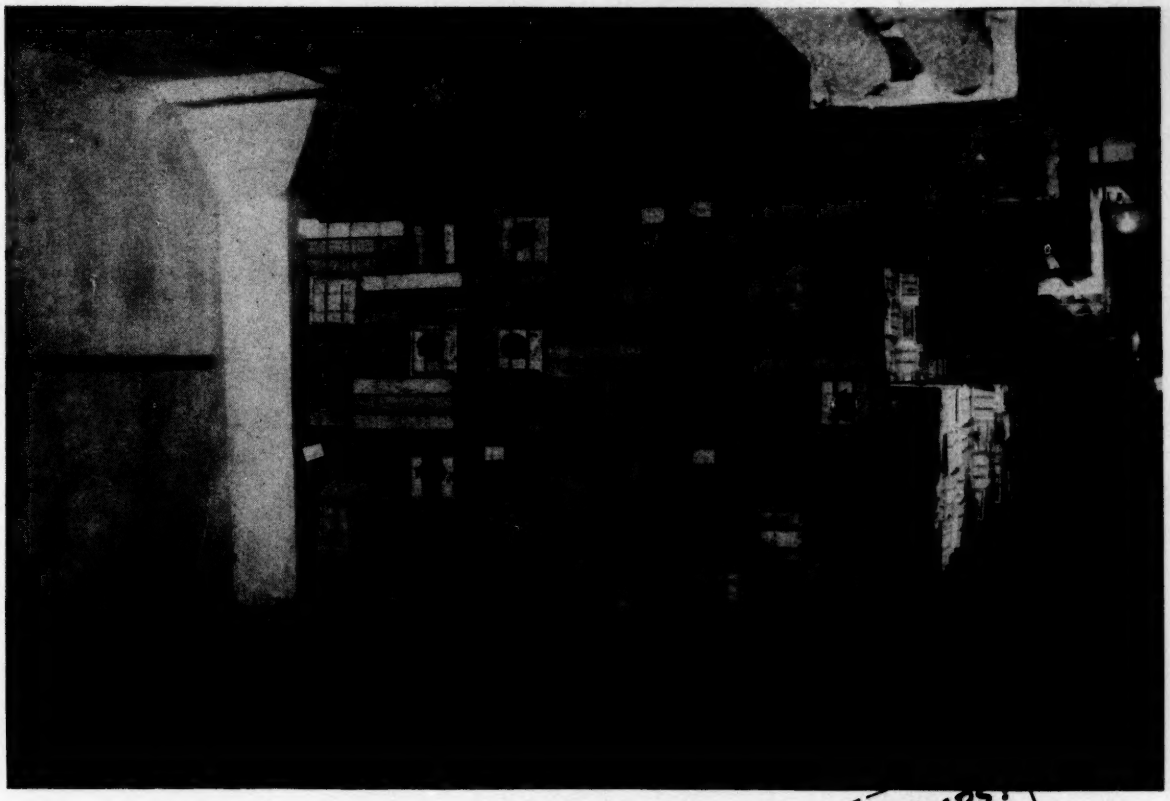


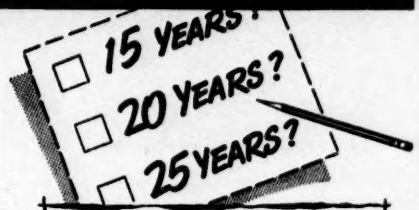
How old is the insulation in this cold storage room?

It's just about impossible to estimate correctly the age of a good insulation job. The corkboard on the walls of this cold storage room, for example, shows almost no signs of long service. Despite continuous operation the insulation is dry and free of frost. There's no bulging or buckling and it's still highly efficient. Yet, this corkboard was installed in 1928 — 25 years ago.

The Merchants Refrigerating Company warehouse in Newark, N. J., contains nine floors of cooler and freezer storage space. When the warehouse was built in 1928, these rooms were insulated with 722,000 board feet of Armstrong's Corkboard. Although the rooms have been in continuous operation for 25 years, the insulation has required no major replacements or repairs. It is still holding temperatures at surprisingly low refrigerating costs. In fact, it promises many more years of highly satisfactory service.

This case is by no means unusual. Our records show that hundreds of installations using Armstrong's Corkboard are today performing at peak efficiency after 20, 30, and even 40 years.

But it takes more than top-quality insulating materials to give long, low-cost service like this. The way those materials are installed can add years to their effectiveness, too. That's why it's a good idea to contact Armstrong whenever you're planning any low-temperature work. Armstrong's complete contracting organization can handle all phases of the job for you—from correct specifications to proper application. You get the kind of thoroughly professional job that means years of trouble-free service when Armstrong does your insulation work. For further information, just call your near-by Armstrong office or write Armstrong Cork Company, 4503 Concord Street, Lancaster, Pennsylania.



Complete Insulation Contract Service

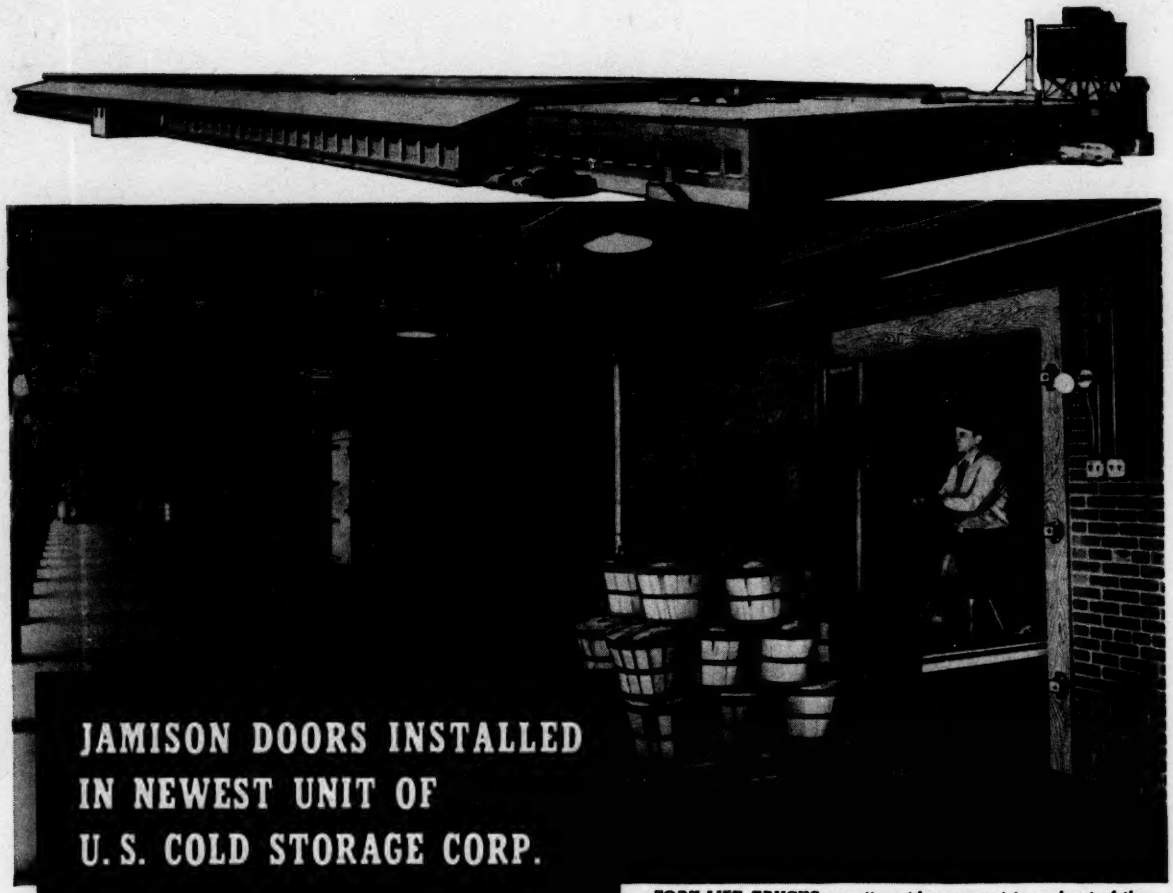
There are many factors that can't be written into an insulation contract, but which can largely determine whether or not the agreement will be entirely satisfactory. They include:

1. Financial responsibility—resources to complete the contract despite any unforeseen events.
2. Integrity—a reputation for quality work and for prompt settlement of any justified complaints.
3. Technical ability — experience, plus technical and research staff to do the job in accordance with best practices.
4. Manpower resources — trained supervisors and workmen able to handle any contract efficiently.
5. Efficiency — ability to deal with problems of accounting, tax provisions, insurance, and workmen's compensation.

You get all these with an Armstrong Contract

ARMSTRONG'S INDUSTRIAL INSULATIONS

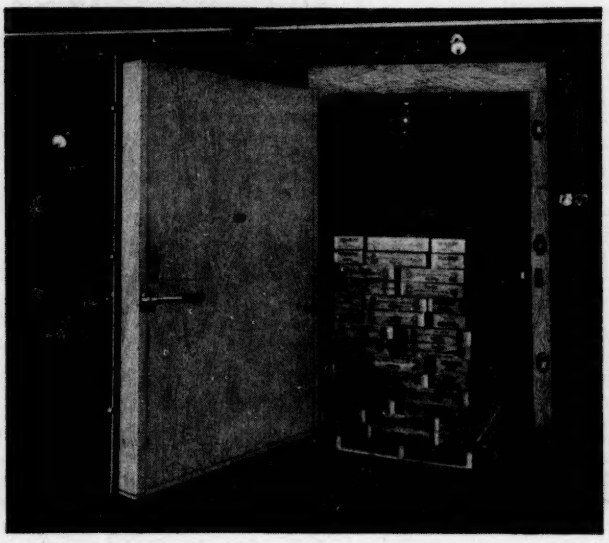
For temperatures from 300° below zero to 2800° F.



JAMISON DOORS INSTALLED IN NEWEST UNIT OF U. S. COLD STORAGE CORP.

FORK-LIFT TRUCKS permit rapid movement in and out of the cold storage rooms along this loading dock.

The U. S. Cold Storage Corp. has equipped its splendid new Omaha plant entirely with Jamison modern Series "50" Cooler and Freezer Doors. This new warehouse combines the latest in design, methods and equipment. It has 2,000,000 cubic feet of refrigerated space and a storage capacity of 25,000,000 pounds.



Jamison's exclusive hardware and rigid box-girder construction stand up under the heaviest punishment of electric truck operation. At this installation, the Series "50" doors meet a wide range of storage requirements. The 5-by-8-foot opening permits faster and easier handling by lift trucks.

There are 26 Jamison doors in the warehouse. Twenty-two open onto the loading dock with eleven on the track dock and eleven on the truck dock. Request Catalog No. 3 for details and specifications. Jamison Cold Storage Door Co., Hagerstown, Md., U. S. A.

THESE UNUSUALLY WIDE doors permit rapid movement of heavy loads by means of hand trucks as well as electric trucks.

JAMISON

HAGERSTOWN, MARYLAND, U. S. A.

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